ANNUAL REPORT

—OF THE—

BOARD OF DIRECTORS TO THE STOCKHOLDERS,

AT THEIR ANNUAL MEETING,

January 21, 1891.

The Edison Electric Illuminating Co. of New York.

COLUMBIA
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Board of Directors,

Elected January 21, 1891.

R. R. BOWKER,
C. H. COSTER,
CHARLES E. CROWELL,
THOMAS A. EDISON,
J. BUCHANAN HENRY,
E. H. JOHNSON,
J. P. MARQUAND,
D. O. MILLS,
GEO. FOSTER PEABODY,
F. S. SMITHERS,
SPENCER TRASK,
HENRY VILLARD,
J. HOOD WRIGHT.

Officers:

SPENCER TRASK, - - - - - *President.*
R. R. BOWKER, - - - - *First Vice-President.*
J. B. SKEHAN, - - - *Secretary and Treasurer.*
JOS. WILLIAMS, - - - - - *Asst. Secretary.*

GENERAL OFFICE,
432 FIFTH AVENUE.

EXECUTIVE OFFICE,
16 BROAD STREET.

STATIONS:

255–257 PEARL STREET,
117–119 WEST 39TH STREET,
47–49–51 WEST 26TH STREET,
529 PEARL STREET,
53–57 DUANE STREET

ANNEX STATIONS:

60–62 LIBERTY STREET,
PRODUCE EXCHANGE.

NEW YORK CITY.

ANNUAL REPORT.

To the Stockholders of

THE EDISON ELECTRIC ILLUMINATING COMPANY OF NEW YORK.

In presenting the annual report of operations during the past year, it is gratifying to notice a continued increase in the business and prosperity of your Company.

The total earnings for the year ending December 31, 1890, were	$446,268	61
Operating expenses, repairs and renewals	192,934	95
Net earnings of stations	$253,333	66
Income from other sources	42,327	22
	$295,660	88
Less general expenses and taxes	$66,582	08
Net earnings of Company	$229,078	80
Less interest allowance on proportion of bonds issued for property in use during 1890	24,000	00
Total net income	$205,078	80

It seems not inappropriate at this time to give a summary of gross and net earnings since 1884, and also to submit a table showing the growth of the business of the Company in other respects:

	GROSS.	NET.
1884	$111,872 57	$ 33,222 54
1885	131,332 99	51,551 76
1886	157,579 86	70,051 05
1887	191,635 39	89,069 96
1888	226,301 76	116,235 26
1889	327,678 99	124,031 97
1890	488,595 83	229,078 80

	1888.	1889.	1890.
Number of Customers	710	1,213	1,698
Number of lamps, 16 c. p.	16,377	39,815	64,174
Number of motors, h. p.		470	697

Attention is called to the fact that the earnings for the last three months of 1890 are based upon a decreased rate of charges to the public, it having been deemed advisable to reduce the rate on the first of October, 1890, to a uniform price of one cent per 16 c. p. lamp per hour. This is in accordance with the general policy of the Company to decrease the price of current as fast as the increase of its business and the improvements of its operating facilities permit.

The outlook at the beginning of last year led your Directors to recommend large additional installations, covering territory not theretofore occupied, also important additions to the existing plant. A plan to accomplish these purposes was adopted at your last meeting, and it is now being carried into effect. This plan provided for the increase of the capital stock from $2,500,000 to $4,500,000, and the creation of a mortgage to secure $5,000,000, 5% convertible bonds, of which $2,000,000 were to be issued. All of these securities were duly subscribed for, the bulk of them being taken by the stockholders of the Company under the option offered them, which provided for payments in installments as called for by the Company. At the close of the fiscal year $296,100 remained uncalled for; this amount will be payable on the 26th inst. in pursuance of a call recently made. You will be requested to authorize the

issue of $250,000 more bonds during the present year, which it may be desirable to use for additional construction work, said bonds to be issued when the necessities of the Company require. A part of the new capital already furnished has been used to take up the floating indebtedness of the Company, which had been temporarily incurred for construction, and the remainder has been or will be used for the purchase of land for, and the erection and equipment of the new station, now in progress, in Pearl street, near Elm, and the laying of the underground conductors connected therewith, also for the extension of the underground system uptown, and for additional machinery where needed, in the already existing stations. Much delay and almost insurmountable difficulty was experienced by your Board in procuring sufficient land for the new station above mentioned. Finally a plot was secured in the westerly part of the block bounded by Elm, Pearl, Centre and Duane streets, which had been selected as a very favorable location for the purpose. The tract is larger than the Company requires, but nothing else was available. Only a portion of it consisting of 75 feet on Pearl street and running back 120 feet towards Duane street is to be occupied by the station now in progress; but the property acquired will admit of the station being extended back 68 feet additional to Duane street (thereby affording a double entrance) whenever the business of the company shall require, meanwhile the land not used for the present station is leased so far as practicable for short periods on terms that go towards paying interest on the investment. The new station with some subsidiary annexes, is intended to supply the entire southern portion of New York, doing away ultimately with the present downtown station in Pearl street near Fulton. It will be the largest electric lighting station in the United States. In consequence of improved machinery, new lamps, etc., a greater efficiency from all stations has been secured, thus enabling the Company to extend an area supplied from each central station beyond

what was thought possible some years ago ; so that, by means of our new Pearl street station and the present 26th street station, it is hoped to supply all of the best paying portion of the city south of 34th street, instead of having three or four stations within this area, as at one time was thought necessary. For the same reason it has been decided not to erect a station in 53d street, but to supply the territory below 59th street from the present 39th street station. The land which the Company now owns in 53d street and which was purchased with the intention of building there, will therefore be sold.

On January 2d, 1890, as mentioned in the last report, a fire occurred in the present Pearl street station, which was fully covered by insurance. Unfortunately, however, $7,677.53 of this insurance proved to be worthless, as the out of town companies which had covered were declared bankrupts before the insurance was collected; and the loss has been charged to Reserve Fund.

In accordance with the usual policy of the Company, the sum of $10,000 as well as a further sum of $7677.53 to cover the fire loss as above have been credited to Reserve Fund, making a total of $50,000, now at the credit of the Reserve Fund.

In the early portion of the year the services of Mr. R. R. Bowker were secured as First Vice-President of the Company, and attention is called to his report, submitted herewith, which enters more fully into detail as to the operations of your Company during the past year. The Board takes pleasure in putting on record their high appreciation of the zeal and ability with which Mr. Bowker has fulfilled the duties of his position.

The Board also desires to express their thanks to the officers and employes for their faithful and efficient services during the past year.

Your attention is called to the balance sheet and statement of income account herewith.

By order of Board of Directors,

SPENCER TRASK,

President.

12 Jan., 1891.

SPENCER TRASK, Esq., President,

THE EDISON ELECTRIC ILLUMINATING CO. OF NEW YORK.
16–18 Broad Street,
New York City.

SIR :

The efforts of the past year have been sucessfully devoted to the increase of the Company's business and the development of an organization and of administrative methods adequate to the business which the Company must handle in the near future.

Between January 1st, 1890, and January 1st, 1891, the number of customers of the Company has increased 40 per cent. (1213 to 1698) ; the installation of incandescent lamps 60 per cent. (39,815 to 64,174), of arc lamps over 100 per cent. (125 to 254), and of motors 48 per cent. (470 H. P. to 697 H. P.) ; the total installation, including arc lights and motors, 60 per cent.

The administrative forces have been reorganized to make each department fully responsible for its internal administration, and in well defined relation with each other department, under a system by which each important officer has an assistant or substitute acquainted with the general work of the department and ready to take his principal's place in any emergency.

The practical administration now includes the Operating Department, the Wiring and Supply Department, and the Underground or Street Department, each with its Superintendent, while the Canvassing Division, the Inspection Division, and the work of the Chief Electrician are especially associated with the General Office.

The city below Fifty-ninth street is divided geographically into three districts, the *first* extending from the Battery to Eighth street, the *second* from Eighth to Thirty-fourth street, excluding Thirty-fourth street, and the *third* from Thirty-fourth street, inclusive, to Fifty-ninth street.

The chief of each department or division has jurisdiction through all these districts, although the Superin-

tendents of the Underground and Wiring Departments have special representatives in special charge of the downtown district.

Prices and Customers.

Previous to October 1st, 1890, the price of current had been 1.2 cents per 16 c. p. lamp hour in the down-town district, and 1.1 cents per 16 c. p. lamp hour in the up-town districts, (less, in the latter case, ten per cent. for cash), with further discounts as stated in the contract form, depending upon the amount of monthly bills. On September 1st, announcement was made through the public press that from October 1st the rate would be a uniform cash price of one cent. per 16 c. p. lamp hour, less the schedule discounts on large monthly bills, and occasion was taken at this time to do away with the inequalities which had arisen under the old system. This change has resulted in strengthening and increasing the patronage of the Company. As then announced, the change is in line with the general policy of the Company, of popularizing the electric light by reducing prices as the increase of business decreases fixed expenses and permits such reduction.

No change was at that time made in the charges for arc lighting, which had already been placed on a close basis, or in motor service, but the Company is now considering a new scale of prices for motor service, which will be made as low as is practicable, with a view to extending that important branch of the Company's work.

The advantages to users of light of a current which is absolutely harmless to life, and which can be used not only for incandescent lighting, but also for arc lamps which can be turned on or off at will, and for supplying power to any extent, are becoming every day more and more manifest, and if ultimately the electric current can also be used, economically, for heating purposes, the field of income will be enormously increased, a single connection by wire thus enabling every household to obtain light, power and heat.

Operating Department.

The administration of the several stations has been

concentrated under a General Operating Superintendent, a change which has resulted in more complete and careful comparison of station methods, with great improvement of the administration of each and considerable saving in cost.

The work of installation of lamps, placing of meters, turning on current, lamp renewals and ordinary repairs for each district, has been transferred from the Wiring Department to the District Stations.

The Operating Department, which is the main source of the Company's revenue, shows an exceedingly gratifying record in its increase of production. The indirect results of the Pearl street fire, as developed since the last annual report, have confirmed the opinion there expressed that the confidence of the public in the stability of electric lighting would be increased materially by the record of this Company after this serious disaster. The fire, it will be recalled, started at 6:10 A. M. on January 2d, and ten days afterward the new machinery was in working order, so that at 9 P. M. on January 12th current was again supplied from the Pearl street station, without the loss of a single customer, many of our patrons having been meanwhile supplied from the Liberty street annex. Although it is not expected to continue the occupancy of the present Pearl street station much beyond the present year, it has been thought best to put it in approximately fire-proof condition, so that it will not be subject to the dangers of the old building which burned last year. The reconstructed station has about the same plant capacity as the old, though of improved character, but to the total capacity of the district (which includes also the Liberty street annex), the new Produce Exchange annex, from which current was supplied November 12th, 1890, has added four No. 32 dynamos with a capacity of 2300 amperes or 5000 16 c. p. lights. The down-town district has now a maximum capacity of 10750 amperes or 23369 lamps of .46 amperes each. The installation of incandescent lamps, and their equivalent in arcs and motors, is already much above these figures, but all are never in use at one time. With the completion of the improvements in progress in

the down-town district, this district should be able to install the higher efficiency lamp used up town. The maximum output of this district in 1889 was 7250 amperes, in 1890, 8340 amperes; its best daily average in 1889 was 2760 amperes, in 1890, 3382 amperes.

The second district, in which one "unit" (viz., one 250 H. P. engine and two No. 32 dynamos) has been added, making a maximum capacity of 6900 amperes or 16,428 lamps of .42 amperes each, showed in 1889 a maximum output of 3715 amperes and in 1890 of 6300 amperes; its best daily average in 1889 was 1296 amperes, in 1890, 2137 amperes.

In the third district, from which one unit was withdrawn at the time of the Pearl street fire, the output has not yet approximated its present capacity, but it has increased its maximum output of 1889, 1440 amperes, to a maximum in 1890 of 2745 amperes, with a best daily average in 1889 of 495 amperes and in 1890 of 1005 amperes.

Stations.

The site in Pearl and Duane Streets, near Elm, secured for the new station, is happily at the very location most suitable for the purposes which the Company has in plan. The location is central to the most important lighting districts of the city, being between the banking and general business district to the south, the market district to the southwest, the dry goods district to the west, the important small factory district to the north, and the Bowery and Grand street shop district to the east. The location is one mile from the Battery on the south, within three-quarters of a mile from the rivers on the east and west, and a mile and a quarter from Eighth street on the north. This last street is the southern terminus of the second district and is but one mile south of the 26th street station, so that no part of these districts is distant more than a mile and a quarter from either of the stations, with the exception of the extreme east and west portions at the foot of Grand and Canal streets.

On this site a station building facing on Pearl street, 74 feet front by 120 feet deep, is now in process of erec-

tion, with accommodations for over 100,000 lights, and it is proposed, as there is need, to extend the building through to Duane street, giving accommodations ultimately for over 150,000 lights, and with the development of the new lamp promised by Mr. Edison, probably for over 200,000 lights. The plans have been drawn to provide ultimately for additional stories above to be rented for light manufacturing purposes, including the supply of electric power.

The concrete foundations for the new building are completed, and contracts have been made for carrying the work up through the first story, which will provide a temporary station in which machinery can be installed and used during the construction of the upper stories of the building. Pending this, arrangements were made for the supply of current to the dry goods district by using the basement of the existing building on the corner of Duane and Elm streets as an annex, from which current was turned on in November 1st, of the past year. It is expected that the temporary station (first story) will be completed early in the spring and the other stories during the summer, so that before the opening of the lighting season next fall the new Pearl street station may be fully in shape for the extension of the Company's business in the dry goods and other neighboring districts.

A new annex station has been installed in excellent quarters at the Produce Exchange, so that it will be possible, on the expiration of the lease, to discontinue the less satisfactory Liberty street annex, and concentrate the business of the Company accordingly—the intent being to preserve the Produce Exchange annex as a permanent sub-station in connection with the new Pearl street station when the old Pearl street station is given up.

Various improvements have been made at the second and third district stations. A new "unit" of a 250 H. P. tandem double-expansion engine with a pair of No. 32 dynamos, has been added to the 26th street station and this capacity is nearly exhausted. It is hoped that the development of the 39th street

station will presently justify further additions to its plant. Other improvements to be made at the uptown stations include adequate provision for the weighing of coal on receipt and on delivery to the boilers, and the replacing of the old-fashioned elevators with electric elevators of the newest type.

The proposed fourth district station has been abandoned and the real estate bought for that purpose will presently be sold; it having been found that the so-called "fourth district," with the exception of the vicinity of Third Avenue above 46th street, can be more advantageously supplied from the third district station. Attention is now being given to plans for a relay station of some nature in the northeast corner of this district which can be fed from the 39th street station, and which in turn can supply the territory between 59th and 70th streets, and between 5th and 3d avenues, without the expense of a new station for that limited territory.

The development of the city above 70th street, particularly in Harlem, causes us to look forward to extending our field at an early day, to include the territory north of 70th street, and the construction of an important station for upper New York must soon follow.

Underground Department.

During the past year the mileage of underground conductors has been nearly doubled. At the outset of the Company's business, instead of using a high tension current, dangerous to human life, which would permit of greater economy in copper conductors, the more far-sighted policy was adopted of laying an underground, low-tension system of large conductors, which, though costly at the start, would prove economical in the long run. This course has been fully justified in practice. The Company not only forestalled the demand of the public and of the city authorities that electric wires should be placed under ground, but has, since the establishment of The Board of Electrical Control and the development of the subway system, heartily co-operated with the Subway Company in this field.

The first conductors were laid in the downtown district, on the 2-wire system, in January, 1882, and the

early installation in that district amounted to about 14½ miles, to which but 2 miles had been added up to January 1st, 1890—all on the 2-wire system. It was then decided to convert the old 2-wire system into a 3-wire system, on Mr. Edison's plan of using alternate wires as neutrals, and during the year 1890 22.8 miles of conductors have been laid in this district on the 3-wire system, making a total, downtown, January 1st, 1891, of 39.3 miles.

For the uptown districts the 3-wire system developed by Mr. Edison was adopted from the beginning. The first conductors were laid in July, 1887, and in that year 37 miles of feeders and mains were completed, to which were added, in 1888, 4.9 miles, and in 1889 8.4 miles, making a total, on January 1st, 1890, of 50.3 miles of conductors. To this have been added 23.1 miles during 1890, making a total in the uptown districts, January 1st, 1891, of 73.4 miles.

The total mileage of street conductors in all the districts on January 1st, 1890, was 66.8, and on January 1st, 1891, 112.7 miles, an addition during the year of 45.84 miles of feeders and mains.

The feeder system of carrying the current direct from each central station to numerous distributing points and there feeding into a crib or mesh, so that any one customer is reached by the electric current from both sides, has given to the Edison system a surety and stability which no other method of electric lighting can boast. Its conductors now supply most of the profitable streets east of Broadway and south of the City Hall, and partially the streets west of Broadway and north of the City Hall. The dry goods district has been partially supplied with current since November 1st, 1890. Permits have already been obtained for the extension of the system in the streets west of Broadway below the City Hall, throughout the dry goods district, and in that portion of the city immediately north and east of the new station now building.

Up town the new work of the past year includes all of Fifth avenue, on both sides, with the exception of one block on the east side, left unfinished by the Subway

Company ; Eighth avenue, and a considerable extension of the system on Madison avenue and on the cross streets, so that most of the profitable streets up town are now covered. The development of residence lighting has, however, scarcely more than begun.

Wiring Department.

The Wiring Department, which does the work of house installation, and has hitherto done house repair work also, is rather an auxiliary than an essential part of the Company's business, but in the present stage of the business of electric lighting it is almost a necessity. This department within the past year has done a large business, handling in that period 2894 new installations or repair jobs, and has become self-supporting and profitable.

This department has accomplished much noteworthy and creditable work during the year, particularly in the installations at the great Madison Square Garden, at the Manhattan Club, and in similar important buildings,and it is developing a considerable field in what may be called decorative lighting, as at recent entertainments at Delmonico's, Sherry's, and in fashionable private houses. The department now does a large share of the house installation work done in New York city, for connection both with station current and with isolated plants. The present policy of the Company is to require this department to make its estimates on an economical basis sufficiently above cost to cover a fair commercial profit, so that an intending customer for current may be fairly treated without making it impossible for other wiring contractors to obtain their fair share of business. This basis of fair business competition permits the development of other wiring concerns within the city, so that the business of electric light installation may, like that of placing gas piping, become ultimately an independent business, part of the usual construction work of a new house, thus leading to a corresponding development of the business of supplying current.

The separate organization of the Canvassing and Inspection Divisions under the direct oversight of the General Office, has relieved this department of con-

siderable detail, so that its work may be prosecuted with more efficiency and profit, while these other divisions are placed where they more properly belong.

Other Divisions.

Two important changes have been made in the administration of the Company, by taking the control of canvassers from the Wiring Department and developing a more thorough and effective system of canvassing under the charge of a General Canvassing Agent. Under his direction very successful work has been done in this field and it is only to be regretted that such a department was not organized early in the year instead of during the Fall.

An Inspection Division has also been made, separate from the Wiring Department, under the direct control of the General Office, and it is already accomplishing excellent work in preventing as well as in remedying complaints from customers and in keeping thorough oversight of the isolated plants and house installations of this Company. The necessity of both these changes was proved by the experience of the Company in the early part of the year.

It is important, in conclusion, to note the fact that the earnings of the past year have been based chiefly upon the use of the old capital of the Company, and that in fact the capital actually utilized in industrial production is still but a moderate proportion of the total investment, the investment both in station buildings and in underground construction being far beyond its utilization at the present moment. This has been the result of a confidence which the development of business with each new year fully justifies, and as the business grows with the growing confidence of the public in the safety, stability, healthfulness and economy of the Edison system, it is safe to predict for the Edison Electric Illuminating Company of New York an industrial future and a commercial return far beyond the indications even of its present success.

Respectfully submitted,

R. R. Bowker,
First Vice-President.

THE EDISON ELECTRIC ILLUMINATING COMPANY

OF NEW YORK.

DR. INCOME ACCOUNT YEAR ENDING DECEMBER 31st, 1890. CR.

Dividends paid, 1890:		
February 1st	$25,664 16	
May 1st	25,667 16	
August 1st	25,669 16	
November 1st	25,671 16	
		$102,671 64
Suspense Account:		
Doubtful accounts written off		9,623 94
Loss in Pearl St. Fire		7,677 53
Carried to Reserve Fund		10,000 00
Five per cent. Scrip dividend, 1890		128,390 00
Interest		24,000 00
Balance, December 31st, 1890		39,220 41
		$321,583 52

Profit and Loss:	
Balance, December 31st, 1889	$92,504 72
Net earnings, 1890	229,078 80
	$321,583 52

E. & O. E.
NEW YORK, December 31st, 1890.

J. B. SKEHAN,
Treasurer.

THE EDISON ELECTRIC ILLUMINATING COMPANY

OF NEW YORK.

DR. CONDENSED BALANCE SHEET, DECEMBER 31, 1890. CR.

License under Edison patents	$2,250,000 00	Capital Stock	$3,967,800 00
Real Estate, Construction and Property Accounts:		Bonds outstanding	2,000,000 00
First, Second and Third Districts	3,686,979 46	Convertible Stock Certificates	128,390 00
Sundry Accounts and Supplies on hand	189,632 59	Installment on new stock	203,900 00
Customers' Accounts	136,267 52	Reserve Fund	50,000 00
Cash on hand and in Trust Cos	167,960 78	Accounts payable	41,529 94
		Profit and Loss	39,220 41
	$6,430,840 35		$6,430,840 35

E. & O. E.

NEW YORK, December 31st, 1890.

J. B. SKEHAN,
Treasurer.

ANNUAL REPORT

—OF THE—

BOARD OF DIRECTORS TO THE STOCKHOLDERS,

AT THEIR ANNUAL MEETING,

January 26, 1892.

The Edison Electric Illuminating Co. of New York.

Board of Directors,

Elected January 26, 1892.

A. A. H. BOISSEVAIN,
R. R. BOWKER,
C. H. COSTER,
CHARLES E. CROWELL,
THOMAS A. EDISON,
J. BUCHANAN HENRY,
E. H. JOHNSON,
D. O. MILLS,
GEO. FOSTER PEABODY,
F. S. SMITHERS,
SPENCER TRASK,
HENRY VILLARD,
J. HOOD WRIGHT.

Officers:

SPENCER TRASK, - - - - - *President.*
R. R. BOWKER, - - - - *First Vice-President.*
J. B. SKEHAN, - - - - *Secretary and Treasurer.*
JOS. WILLIAMS, - - - - - *Asst. Secretary.*

GENERAL OFFICE,
PEARL, COR. ELM STREET.

FISCAL OFFICE,
16 BROAD STREET.

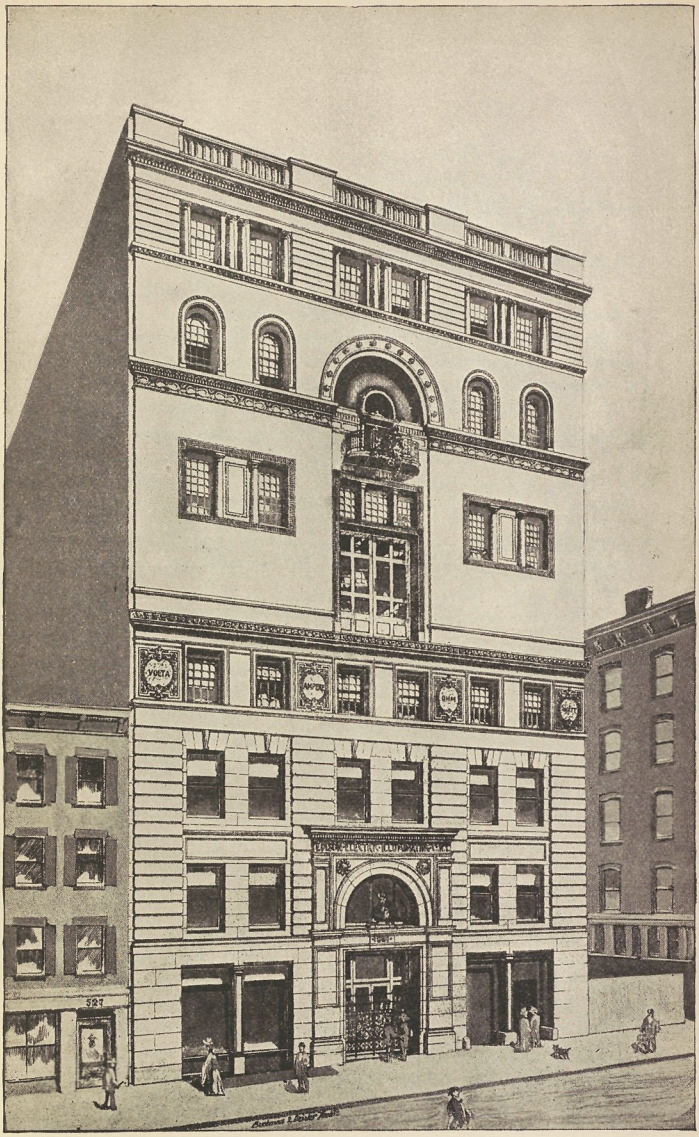
STATIONS:

PEARL, COR. ELM STREET,
255–257 PEARL STREET,
47–49–51 WEST 26TH STREET.
117–119 WEST 39TH STREET.

ANNEX STATION:

PRODUCE EXCHANGE.

NEW YORK CITY.



NEW CENTRAL STATION OF THE EDISON ELECTRIC ILLUMINATING CO. OF NEW YORK.

Pearl Street front—now built to the height of adjoining buildings.

NEW YORK, January 28th, 1892.

To the Stockholders of

THE EDISON ELECTRIC ILLUMINATING COMPANY OF NEW YORK.

DEAR SIRS:

In accordance with usual custom, for the information of the stockholders, the Directors submit herewith a condensed statement from the books of the Company showing the operations of your Company during the past year. For the fuller financial statement, we refer to the tables accompanying this report:

The station earnings of the Company for the year ending December 31, 1891, were	$635,575 49
Operating expenses, repairs and renewals	263,605 93
Net earnings of stations	$371,969 56
Income from other sources	39,929 94
	$411,899 50
Less general expenses and taxes	64,670 87
Net earnings of Company	$347,228 63

The following table shows the increase of the business since 1884:

	GROSS.	NET.
1884	$111,872 57	$33,222 54
1885	131,332 99	51,551 76
1886	157,579 86	70,051 05
1887	191,635 39	89,069 96
1888	226,301 76	116,235 26
1889	327,678 99	124,031 97
1890	488,595 83	229,078 80
1891	675,505 43	347,228 63

	1888	1889	1890	1891
Number of customers	710	1,213	1,698	2,875
Number of lamps, 16 c. p.	16,377	39,815	64,174	94,485
Number of motors, h. p.		470	697	2,000
Number of arc lights		110	254	841

Estimating each h. p. motor and each arc light equal to ten 16 c. p. lamps, the present installation is equal to 122,895 lamps.

It must be a matter of congratulation to the stockholders to notice

the steady increase in the business of the Company, as shown by the above figures. The net earnings show over 50% increase from the previous year. The demand upon the Company for its product is practically limited only by the capacity of the plant to supply it.

The report herewith of the First Vice-President goes more fully into the details of the operations of your Company.

During the past year further progress has been made toward the completion of the new station on Pearl and Duane streets, (near Elm), to which reference was made in our last report. In order that the building might be utilized at the very earliest moment, and that the capital invested there might make as quick a return as possible, the building was only carried up to the top of the second story. The floor of the intended story above being of iron and tile, forms a sufficiently satisfactory roof for the time being. Even before the roof was on, machinery was put in the building, and current was supplied to the immediate neighborhood. Your Directors are now considering the advisability of extending the building so as to cover more of the ground, rather than to carry the present building higher, as is intended to be done in the more distant future. This will not only secure, in all probability, a more immediate return upon the outlay, but will also enable the Company the quicker to supply the demand for current that exists throughout the dry goods district.

The completion of the new station to the top of the second story furnished the Company with sufficient room to concentrate all the offices of the various departments in one place, thus materially facilitating the execution of business.

During the year steady progress has been made in the extension of the underground system, looking to a more complete covering of the city below 59th street. It has not been practicable to supply current above 59th street during the present winter, as it was hoped and expected to do, but a portion of the system has been laid east of Central Park, and during the present year it is probable that the Company will be able to furnish the light to the many applicants that it already has in that neighborhood.

In the last report, attention was called to the fact that in consequence of recent inventions, greater efficiency from all the stations had been secured, so that the Company was enabled to extend the area supplied from each central station beyond what was thought possible some years ago. This statement has been confirmed by the

experience of the past year, and the change of plans based upon its early appreciation have been so far more than justified.

It seems inevitable that in carrying on the operations of a Company as large as yours, and in dealing with the many questions incident to a comparatively new business, changes should constantly have to be made in any suggested policy. Last year your Directors suggested it might be desirable not to erect a station in 53d street, in which case, the land owned by your Company there could be sold. It now seems probable that it will prove desirable to utilize this property by erecting there a comparatively inexpensive distributing station. No final decision, however, has as yet been reached by your Directors.

The effort of your Board has been to keep thoroughly abreast with every new improvement or invention that would tend to a greater efficiency in the Company's work, and they believe that, as regards both efficiency and smoothness of operations, the plant may fairly be considered to be the equal, if not the superior, of any electric light plant in the world.

In order to maintain the Company's present position and more completely to occupy the field which belongs to it, and which holds forth the promise of such satisfactory returns upon all capital invested, it is necessary that your Company should be ready to extend its plant as opportunity offers, and, in order to be prepared in this respect, the Directors will submit to the stockholders, at an early date, a plan to provide funds for work during the coming year, as also for some extra work done during the past year, which plan it is believed will meet with your approval. The credit of the Company is now upon such a sure financial basis that no difficulty seems likely in securing whatever funds are necessary.

Your Board take pleasure in bearing testimony to the efficiency which has been displayed by the various officers and employees in carrying on the affairs of the Company.

Your attention is invited to the accompanying detailed report of the First Vice-President, also to the Balance Sheet and statement of profit and loss herewith.

By order of the Board of Directors,

SPENCER TRASK,
President.

New York, 5th Jan., 1892.

Spencer Trask, Esq., *President.*

THE EDISON ELECTRIC ILLUMINATING COMPANY OF NEW YORK.

Sir :

The past year has resulted in an increase of this Company's business quite beyond precedent in the history of electric lighting.

Between January 1st, 1891, and January 1st, 1892, the number of customers of the Company has increased 69 % (1,698 to 2,875) ; the installation of incandescent lamps 47%, (64,174 to 94,485), of arc lights, 231% (254 to 841), and of motors, 188% (697 H. P. to 2,000 H. P.) ; the total installation, including arc lights and motors, 66% (the equivalent of 73,684 16 c. p. lamps to the equivalent of 122,895 16 c. p. lamps).

The financial results of the year are correspondingly satisfactory, as is evidenced by the Treasurer's report, submitted herewith. After deducting the cost of obtaining business by the Canvassing Department, and the considerable expense of placing temporary installations of machinery in the stations to meet immediate exigencies, the Company shows net earnings exceeding five per cent. on its entire stock and bond capital, although much of that capital is invested in underground construction which is but just beginning to make return on the investment so made.

Operating Department.

The Operating Department, the main source of the Company's revenue, has shown during the year, under the headship of Mr. H. J. Smith, an exceedingly gratifying record, both in its increase of production and in the way in which it has handled this large increase of business with the facilities at its command. As the demand for electric current has increased, it has been necessary to crowd our stations with temporary plant, pending the development of the new multipolar dynamos, at a considerable disadvantage in operation ; it is the more-gratifying, therefore, to record that the Company has been able to keep up to the demands upon it, and more than pay for

any temporary machinery or expedient by the immediate increase in revenue.

The important fact of the year has been the construction of a sufficient portion of the Company's new building on the property on Pearl street near Elm street, to give room for a temporary station as well as for the General Offices of the Company. The record of this work is highly creditable to the Company and to those concerned in the construction. The ground was purchased in the latter part of July, 1890, and on the 1st of August, 1890, work was commenced in tearing down the structures which occupied so much of the site as was immediately needed. By May 1st, 1891, the building had been pushed forward so that it was practicable to install a temporary electric plant, including boilers, engines and dynamos, and current was delivered from the new station on that day, the Liberty street annex being abandoned at that time. All the temporary construction was put in place so as not to interfere with the permanent installation of the new electrical units when ready.

The down-town district now includes the new central station, the old Pearl street station and the Produce Exchange annex. During the year the maximum load on this district has reached 13,550 amperes, the equivalent of about 32,000 16 c. p. lamps burning at one time. The best daily average of the year was 5,200 amperes. The maximum output of this district in 1890 was 8,340 amperes, in 1889, 7,520 amperes; its best daily average in 1890, 3,382 amperes, in 1889, 2,760 amperes. The development of new business was in part caused by the extension of the underground system, but was also largely an increase of business within the old territory.

The second district, (26th street station), showed for the year a maximum output of 10,000 amperes, and its best daily average was 4,400 amperes. The maximum output in 1890 was 6,300 amperes, and in 1889, 3,715 amperes; its best daily average in 1890 was 2,137 amperes, and in 1889, 1,296 amperes.

The third district (39th street station), has reached during the year a maximum output of 5,100 amperes, and its best daily average was 2,900 amperes. Its maximum output in 1890 was 2,745 amperes and in 1889, 1,440 amperes; its best daily average in 1890 was 1,005 amperes; in 1889, 495 amperes. The fact that this station is now run as an annex to the 26th street station of course reduces its average load, the burden during twelve hours of the twenty-four being carried entirely by the 26th street station.

It will be seen from these figures that the maximum capacity of machinery required at any one time was little, if any, above 60 per cent. of the total installation of lamps and motors, a fact which is of considerable interest and consequence in the development of electric lighting.

New Machinery.

During the early part of the year the Company sent its Chief Electrician and Consulting Engineer, Mr. John Van Vleck, to Europe, with instructions to visit the leading electrical plants and engine-building establishments with a view to obtaining the latest information as to mechanical and electrical developments before giving final orders for the machinery for the new station. This visit has already produced excellent results, the first of which is the development of the new type of engine for electrical purposes known as the "Van Vleck Disconnective Triple-expansion Engine," one of which is already in use at the 26th street station. Although the contract was not given out until late in the summer, and the engine was of entirely new type, for which drawings and patterns had to be made from the beginning, the engine was in our station and at work within the month of December, and was taking part of the burden of the holiday lighting—a result very creditable to the Dickson Manufacturing Co., of Scranton, Pa., which developed it for us. The engine includes many features which make it especially desirable for electric lighting in city stations where the question of ground space is of first importance, its steam chests being placed at the side of the cylinders instead of between, so that a third is saved in length, while, as the width of the electrical unit is determined by the diameter of the multipolar fields, there is abundant room alongside the cylinder for the steam chests. Another feature of importance is the use of disconnective piping, so that in case of breakdown any two cylinders can be run as a compound engine, or any one cylinder as a single, a feature of the utmost value in electric lighting stations, which cannot afford to make unnecessary investments in reserve machinery. There are several other features of importance which can scarcely be set forth here. We are now trying, in competition with this engine, two other types, with the purpose of obtaining for this Company the best possible results.

Careful attention has also been given to the question of dynamo construction, which we trust will not be without its effect in the development of the final type of dynamo for our use.

Simultaneously we negotiated with the Babcock and Wilcox Company for a new type of boiler, which has been developed partly for our special use, on their "double-deck" system, with wrought iron headers, so as to give large capacity compared to ground plan and sufficient strength to sustain 200 lbs. steam pressure, if necessary. Two of the boilers are temporarily installed and are already giving considerable satisfaction, but we are about to make further competitive experiments to determine whether another type can give as good results in less room and at less cost.

Mr. Van. Vleck also gave much attention to the subject of steam piping and the utilization of waste heat, and it is expected that the new plant of this Company, when finally developed, will produce results in this direction which will be in advance of anything to be found elsewhere.

Station Buildings.

It was decided to complete the new station only to the top of the second story, as this would give reasonable capacity for boiler, steam and electrical plant to the extent of immediate necessities, and room for the administrative offices above, utilizing only that portion of the land fronting 74 feet on Pearl street and extending 120 feet south from the building line. It was the intention to provide for the completion of the upper stories of that portion of the building and plans are ready for that purpose. The Pearl street facade of the proposed building is shown in the view which accompanies this report, and attention may be called to the special feature which the architects were instructed to embody in their plan—that all the ornamentation is in electrical forms, thus stamping the building with marked and characteristic individuality, as an industrial building should be stamped. In view of the belief that the last word is not yet said in regard to steam and electrical development, I am now prepared to recommend the extension of the building through to Duane street rather than the completion of the present portion by the addition of the upper stories. It has been found by careful calculation and arrangement that sufficient boiler, engine and dynamo capacity can be put on that floor to double the present capacity of the entire first district, and if we are authorized to push forward this work during the year, it is probable that the old Pearl street station can be dispensed with during the coming winter. The business of the Company, however, grows at such an unexpected rate that it is not practicable to make absolute pro-

mise to that effect. As before stated, every provision of temporary plant has been made so as to leave room for the placing of the permanent plant, and for the transfer of any plant temporarily installed to its final position, and any cost of such temporary installation had been in each case fully covered and more than covered by the immediate return.

During the year important improvements have been made at the old Pearl street station, with the intention of rendering that building as nearly fireproof as possible, and providing, also, for proper facilities in case of difficulty. The engine and dynamo room has been cut off from the upper part of the station building by a fireproof tile arch, the smokestacks have been protected by fire tiles, and a thorough system of water supply has been introduced, with the result of very considerably lessening the insurance rate on the building and contents.

It should be noted that during the water famine special attention was given to the supply of water so as to safeguard our customers in case the supply of City water should sink still lower. Wells have therefore been driven or put in working order in each of the stations where water could be had from natural sources, and it is gratifying to report that the new station proves to be in the best position in the City for a natural supply of water through artesian wells. The three wells already driven have a capacity of 1,000 gallons a minute, and during the water famine we were not only able for a short time to utilize this water for our boilers—it being of a character which permitted temporary but not permanent use for boiler supply—but also to offer to the City, through the Department of Public Works and Fire Department, a considerable supply for use in case of emergency in fires in the dry goods district and elsewhere in the neighborhood. This offer was very cordially and gratefully accepted by the Commissioner of Public Works and the Chief of the Fire Department. It is gratifying to record that there was no immediate need for utilization of this supply.

Underground Department.

The mileage of underground conductors has been much increased during the year, and the two-wire conductors have been converted into a three-wire system on the plan developed by Mr. Edison, of using alternate wires as neutrals. Within the year, also, the several districts have been joined together at the junction boxes, so that the

entire Edison system, from Bowling Green to 59th street, is now continuously connected, and is fed from all our stations. The results have been in every way satisfactory, and have shown no offsetting disadvantages.

During the year 16.34 miles of mains and 6.34 miles of feeders were laid in the downtown district, making a total on January 1st, 1892, of 61 miles; in the uptown district 10.11 miles of conductors, and 1.96 miles of feeders were laid during 1891, making a total in that district, January 1st, 1892, of 85½ miles.

The total mileage of street conductors in all the districts, on January 1st, 1891, was 112⅜ miles, and during the year, as above reported, 34¾ miles of feeders and mains have been built, making a total, January 1st, 1892, of 147 miles. From this, however, should be deducted re-laying of some of the conductors, chiefly in the old district, to an extent which reduces the present mileage of the Company to 142 miles.

The new work of the year includes the completion of our mains and of such feeders as could practically be laid on that thoroughfare, on both sides of Broadway, making our lines continuous on that street from Bowling Green up to the northern limit of our system. It has also been the endeavor of this Company to lay its tubes wherever the Commissioner of Public Works was placing new pavement, and the future requirements of business seemed to justify investment. The result has been that the greater part of the most remunerative portion of the city is now directly on the lines of the Edison system, although much has to be done during the coming year in extending the system north of 59th street on the east side, and in providing for the important districts, where a large demand for motor service is expected, on the east and west of Broadway, between the new station and 14th street.

As the Commissioner of Public Works was repaving Madison avenue and several of the streets above 59th street arrangements were made whereby tubing was laid for this Company as far as possible in advance of this repaving, with the expectation that permits would be granted to connect this tubing with our 39th street station by ducts on the east side of Fifth avenue from 59th street north, or through Madison avenue between 59th and 60th streets, which block had unfortunately been repaved during the previous year, before we had formed plans for covering the district north of 59th street. A number of residences in that neighborhood were

supplied with wiring for electric light in this expectation, but the city authorities declined to issue permits for the two thoroughfares mentioned, last year. While the Company had not made any promises which did not take into account the necessary assent of the city authorities, would-be customers in that district were led to share our expectations that a connection would be made, and a considerable disappointment has been the result. There should be no reason why such permits should not be granted during the ensuing season, and the benefit of our current given to the householders in this important residential quarter.

Installation Department.

The Company has done, during the year, a large business in house-wiring, handling in that period 2,286 jobs, representing about 1,300 different installations in connection with the Company's system, or with isolated Edison plants. The repair jobs, as stated in the last report, have now been put in charge of the stations. The wiring department is purely an auxiliary business, and will, ultimately, in all probability, give way to an independent development of the business outside the Illuminating Company. This kind of work is one which is inherently handicapped with many difficulties, but by careful development of its administration, it is hoped to make it as satisfactory to customers and to the Company as other departments of its business. This department had been handled on such a basis as to give opportunity for fair competition in the case of outside wiring contractors, so that independent businesses might be built up. In the latter part of the year Mr. Henry Stephenson was transferred to the position of General Superintendent of the Installation Department, *vice* Mr. W. B. Hadley, resigned, and the department is now in process of a reorganization of its working forces and methods which had not been practicable until the whole business could be concentrated in one place, as it is now at the new central station. Many complaints of customers, as to delays and other difficulties, were found to be well founded, some of them the fault of this Company, some of them the fault of manufacturers from whom we obtain fixtures and other supplies, but it is believed that these complaints will be minimized during the coming year. During 1891 the department has accomplished some very creditable installations, and has been run on a self-supporting basis, paying a moderate profit.

Other Divisions.

The work of the General Agent, Mr. J. E. Sayles, and of the Canvassing Department under his charge, has shown its effectiveness by actual results. While, of course, the credit for this development should be shared with the other divisions of the Company, I desire to recognize especially the high character of the present staff of canvassers and the effectiveness of their work.

The same good record has been made by the Inspection Department of the Company, under charge of the General Inspector, Mr. Arthur Williams. During the year a more thorough and careful inspecting system has been developed, to which new features will be added during the present year, until a method has been developed not only of thoroughly watching the progress of work in new installations and inspecting them on completion, but of making an inspection of all the installations on our system at stated periods and of arranging also for a special motor inspection service which will benefit our customers while returning a direct source of income for the Inspection Department.

Credit should also be given to the Accounting Department of the Company, which, under the general charge of the Auditor, Mr. W. A. Russell, has not only handled the present large business of the Company satisfactorily, but is developing improved methods of accounting and registration necessary for this particular industry.

In conclusion it should be noted that the financial results of the past year justify not only the recent investment of the Company, but such additional investment as may be required for further extension. Although it has been necessary to lay conductors in streets where the business is still in the beginning of its development, so that little immediate result can be had from that investment, it remains true that in general every dollar which has been put into the Company's treasury by its stock and bondholders has received immediate return, so that it may fairly be said that this Company has the most "*live*" capital possible. The estimates for the new construction of the year will be presented to you in due course, and I need only say that they have been planned with a view of continuing the policy of the Company, that every dollar of capital invested shall produce an increasing rate of return both for itself and for every preceding dollar.

Respectfully submitted,

R. R. Bowker,
First Vice-President.

THE EDISON ELECTRIC ILLUMINATING COMPANY

OF NEW YORK.

DR. INCOME ACCOUNT YEAR ENDING DECEMBER 31st, 1891. CR.

Dividends paid :		
January 15th	$25,672 00	
May 1st	42,957 60	
August 1st	43,679 60	
November 2d	43,680 60	
		$155,989 80
Reserve Fund		25,000 00
Doubtful Accounts written off		10,929 20
Interest		96,023 81
Accrued Interest on Bonds to Dec. 31st, 1891		37,500 00
Balance, Dec. 31st, 1891		61,006 23
		$386,449 04

Balance Dec. 31st, 1890	$ 39,220 41
Net Earnings, 1891	347,228 63
	$386,449 04

E. & O. E.
NEW YORK, December 31st, 1891.

J. B. SKEHAN,
Treasurer.

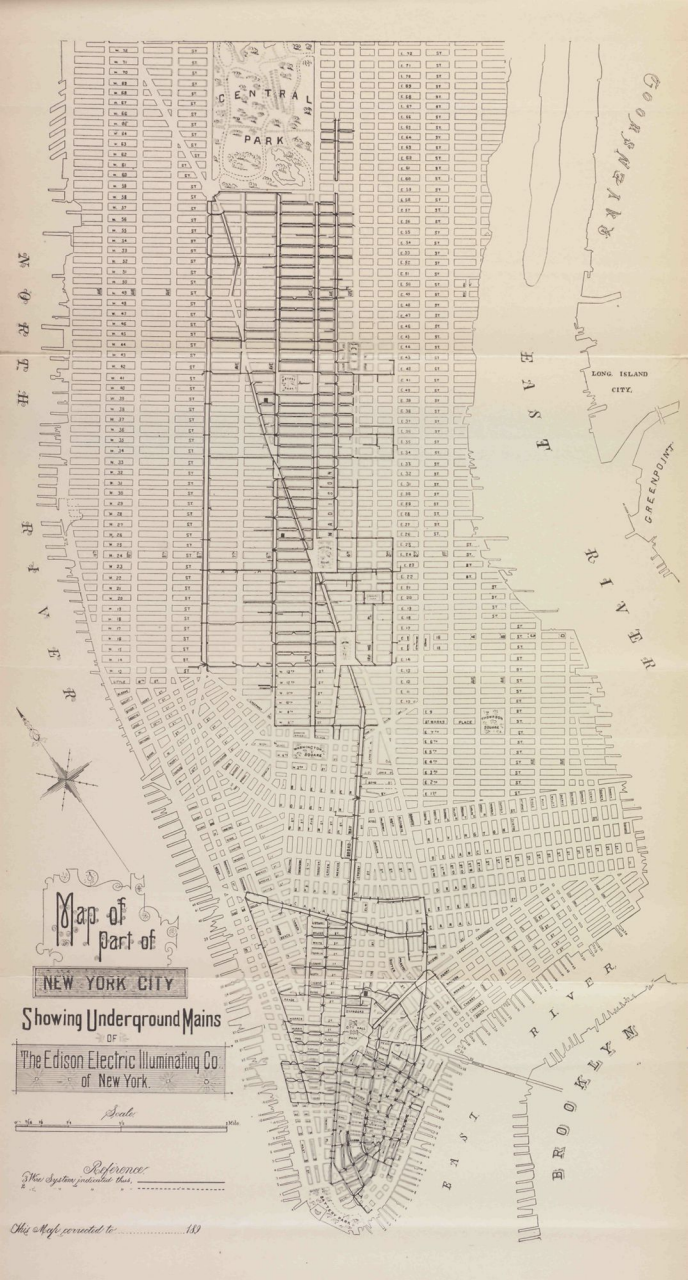
THE EDISON ELECTRIC ILLUMINATING COMPANY
OF NEW YORK.

DR. CONDENSED BALANCE SHEET, DECEMBER 31ST, 1891. CR.

License under Edison Patents	$2,250,000 00	Capital Stock	$4,500,000 00
Real Estate, Construction and Property, and other investment Accts.:		Convertible Scrip Certificates	128,390 00
First, Second, Third Districts and Annex	4,774,386 07	First Mortgage Bonds outstanding	2,250,000 00
Cnstomers' Accounts	149,454 36	Bills and Accounts Payable	384,558 36
Sundry Accounts and Supplies on hand	204,723 90	Reserve Fund	42,000 00
Cash on hand	26,367 78	Sundry Accounts	1,477 52
		Profit and Loss	61,006 23
		Accrued Interest	37,500 00
	$7,404,932 11		$7,404,932 11

E. & O. E.
NEW YORK, December 31st, 1891.

J. B. SKEHAN,
Treasurer.


CENTRAL PARK
NORTH RIVER
EAST RIVER
LONG ISLAND CITY
GREENPOINT
BROOKLYN
EAST RIVER
Map of part of
NEW YORK CITY
Showing Underground Mains
OF
The Edison Electric Illuminating Co
of New York.
Scale
Reference
This Map corrected to

ANNUAL REPORT

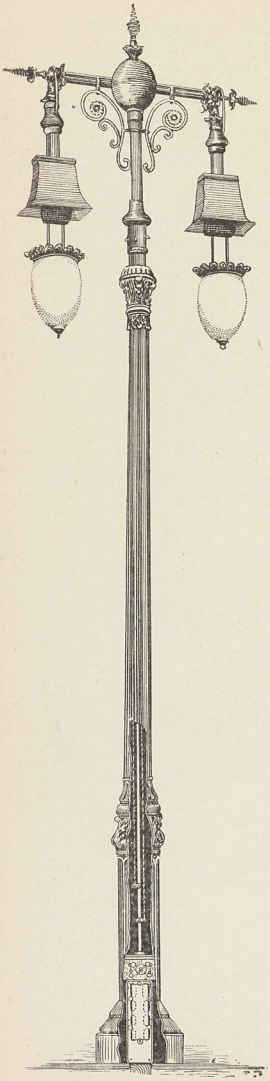
—OF THE—

BOARD OF DIRECTORS TO THE STOCKHOLDERS,

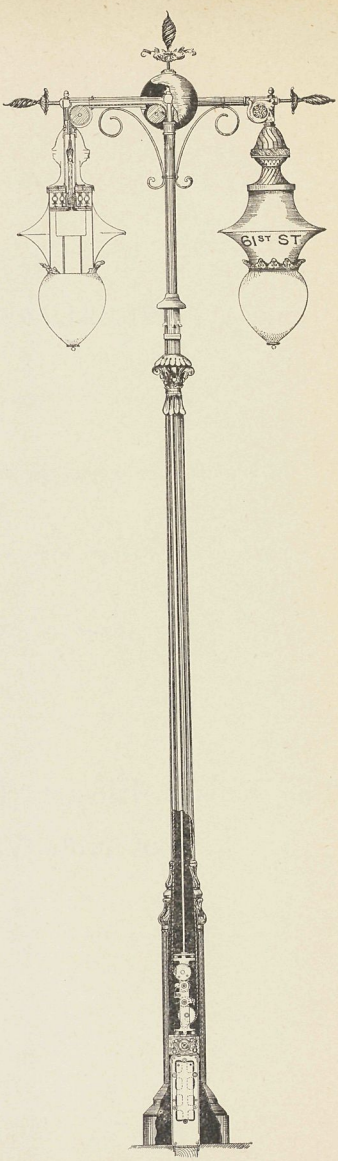
AT THEIR ANNUAL MEETING,

January 17, 1893.

The Edison Electric Illuminating Co. of New York.



FIFTH AVENUE LAMP-POST,
AS INSTALLED.



IMPROVED LAMP-POST,
AS PLANNED.

Board of Directors,

Elected January 17, 1893.

A. A. H. BOISSEVAIN,
R. R. BOWKER,
C. H. COSTER,
CHARLES E. CROWELL,
THOMAS A. EDISON,
J. BUCHANAN HENRY,
E. H. JOHNSON,
D. O. MILLS,
GEO. FOSTER PEABODY,
F. S. SMITHERS,
SPENCER TRASK,
HENRY VILLARD,
J. HOOD WRIGHT.

Officers:

SPENCER TRASK, - - - - - *President.*
R. R. BOWKER, - - - *First Vice-President.*
JAS. W. PRYOR, - - - - - *Secretary.*
JOS. WILLIAMS, - - *Treasurer and Asst. Secretary.*

GENERAL OFFICE,

PEARL, CORNER ELM STREET.

STATIONS:

PEARL, COR. ELM STREET,
255–257 PEARL STREET,
118–120–122 WEST 53RD STREET.
47–49–51 WEST 26TH STREET.
117–119 WEST 39TH STREET.

ANNEX STATION:

PRODUCE EXCHANGE.

NEW YORK CITY.

To the Shareholders of

THE EDISON ELECTRIC ILLUMINATING COMPANY OF NEW YORK.

The past year again bears witness to the steady growth of the business of your Company, thus justifying the expectation of your Directors, as from time to time they have asked for, and so readily received, fresh capital for the extension of the Company's plant.

The results for the year ending December 31st, 1892, are:

The station earnings of the Company were	$942,575 23
Operating expenses, repairs and renewals	385,494 49
Net earnings of stations	$557,080 74
Income from other sources	20,446 02
	$577,526 76
Less general expenses and taxes	$102,389 15
Net earnings of Company	$475,137 61

Increase of the business since 1889 is:

	GROSS.	NET.
1889	$327,678 99	$124,031 97
1890	488,595 83	229,076 80
1891	675,505 43	347,228 63
1892	963,021 25	475,137 61

	1889	1890	1891	1892
Number of customers	1,213	1,698	2,875	4,344
Number of lamps, 16 c. p.	39,815	64,174	94,485	142,492
Number of motors, h. p.	470	697	2,000	3,807
Number of arc lights	110	254	841	1,637

Estimating each h. p. motor and each arc light as equal to ten 16 c. p. lamps, the present installation is equal to 196,932 lamps.

These figures show that the gross earnings have increased 42% and the net earnings 36% over last year; the ratio of net to gross being 49%, or about the same as last year. The net earnings

would have shown even more favorably had the Company not been greatly delayed in the receipt of new machinery upon which it had relied to furnish the ever increasing demand for current. To overcome this temporary difficulty, various temporary devices, involving considerable extra expense, had to be adopted.

The extension of the Elm Street Station, to Duane Street, to which reference was made in last year's report, was commenced last summer. The same plan was followed in it as in the construction of the part on Pearl Street, that is, using portions of the building for machinery during construction, and thus securing more quickly a return upon the investment. This station building has not been carried higher than the second story, either on Pearl or Duane Street, but this year your Directors feel that they must consider the question of adding other stories pursuant to the original plans, in order better to economize space and labor.

The recent decision of the city authorities to proceed immediately with the widening of Elm Street suggests certain new considerations. The widening of Elm Street, as previously contemplated, encroached upon the land purchased for this Company, to the west, and in view of this 25 feet of land on the west side has never been built upon. The plan finally adopted by the municipal authorities during the last few weeks is to cut the new street through to the east of the station building instead of to the west. This gives the Company a much more advantageous frontage, and leaves the 25 feet of valuable land on the west side to be sold or built upon, as may seem wiser in the future.

The increased demand for current in the upper part of the city finally compelled the directors to decide upon building on the land owned by the Company in 53d Street. This station is now in course of construction; but as soon as the foundations were ready machinery was at once placed in position, and on the last day of 1892 current was turned on, thus ensuring a prompt return on the investment. It is proposed to try there the experiment of employing storage batteries. For this purpose an English plant has been imported, aud, if the batteries prove successful, a new advance will have been made in economy of operation. This trial is in the line of

policy which your Directors believe has done so much to place your Company in the very front of all the illuminating companies in the world, namely : the constant search after, and the employment of all the best methods and most practical appliances wherever found.

In 1891 your Chief Electrician was sent to Europe, and as a result of his investigations, he developed a new and powerful engine which bears his name and which has proved most successful. Full descriptions and cuts of this engine accompany this report.

More recently your First Vice-President visited all the principal electric plants in Europe, and returned with many new ideas, which are already bearing fruit in various modifications and improvements in your business.

Especial attention is called to the series of maps accompanying this report, showing the expansion of your Company's business as indicated by the lines of underground mains. It will be observed that the system now extends beyond 59th Street and as far as 79th Street on the east side of the Park. The gradual substitution of the three-wire for the original two-wire system in the down-town district is also clearly indicated.

In the early days of electric illumination in this city it was expedient that the wiring of buildings should be done by this Company, owing to the lack of experienced independent workmen. This work has always been regarded by your Directors as somewhat outside the direct business of the Company, involving the employment of a large force of men and an immense amount of detail management. Your Directors have for years been gradually working in the direction of finally giving up this business, and with this end in view they have endeavored to promote the establishment of competent wiring firms. The satisfactory point having been reached, arrangements were made last summer by which the entire wiring department was given up, the business and the supplies on hand being transferred to the New York Electric Equipment Company, which was started by, and is now under, the direct management of Mr. S. Bergman, your Company receiving a large amount of the stock of the wiring company in payment for the supplies and work turned over. This new departure has proved most satisfactory to all concerned, and the wiring company is already earning and paying dividends on its stock.

As already noted, 79th Street is the extreme northern point reached by the Edison System. In the latter part of 1891, an opportunity was offered to secure, through the Edison Light & Power Installation Company, a corporation in which your Company is largely interested, an interest in the Manhattan Electric Light Company, Ltd., and also in The Harlem Lighting Company, and your Directors considered it wise to encourage the Installation Company to avail itself of the opportunity. The Manhattan and Harlem Companies control most of the lighting and distribution of current through that portion of the city to the north of 80th Street and some other parts not covered by our mains, and by this acquisition interests heretofore antagonistic, and threatening to become more so, have been brought into harmonious relations with your Company on a basis which, it is believed, will result in a direct profit on the investment, to say nothing of the indirect advantages secured.

At the beginning of the year financial plans were carefully prepared to secure additional capital for the work then contemplated. These plans provided for the increase of the capital stock to $6,500,000, and of the First Mortgage Convertible Bonds from $2,250,000 to $3,250,000.

During the year 1893 the completion of the Pearl and Duane Street portions of the Elm Street station is intended (as already stated) and it will also be necessary to add somewhat to the present machinery and underground service in order to supply the actually existing demands for current. The necessary financial arrangements for the moderate amount of money required in connection with these matters will have early consideration, and proper recommendations will be made to you in good season.

The larger the scale on which the Company conducts its operations, the greater is the proportionate economy of operating. This proposition is almost self-evident; and it is conclusively shown by the fact that each successive investment of capital in the past has been followed not simply by larger returns, corresponding with the new capital, but in each and every instance by a progressively increased ratio of return on the entire capital of the Company. Of course enlargements of the plant must, to produce satisfactory results, be made with care and judgment, but, speaking generally, it may safely be said that

the possible field of operations is a wide and lucurative one, which is, as yet, occupied only in small part; and it seems evident to your Board that the proper course is to continue to develop over your licensed territory as rapidly as is consistent with business prudence.

The recent decisions confirming the Edison lamp patents, under which your Company operates, are expected to be of great advantage and to strengthen your interests materially.

In closing this report, your Directors again desire to bear witness to the skill and devotion to the interest of the Company, which has been shown by the various staff and other officers, and as well by the employes of the Company. Your attention is invited to the accompanying more detailed report of the First Vice-President, together with the plans and cuts accompanying this report.

By order of the Board of Directors,

SPENCER TRASK,
President.

THE EDISON ELECTRIC ILLUMINATING COMPANY

OF NEW YORK.

DR. INCOME ACCOUNT YEAR ENDING DECEMBER 31ST, 1892. CR.

Dividends paid, 1892:		
May 1st	$57,849 94	
August 1st	57,849 97	
November 1st	62,743 75	
Due February 1st, 1893	66,567 50	
		$245,011 16
Reserve Fund		50,000 00
Accounts written off		7,510 48
Interest on Bonds		78,832 00
Accrued Interest on Bonds to Dec. 31st, 1892.		48,899 17
Balance, December 31st, 1892		51,291 15
		$481,543 96

Balance, December 31st, 1891	$61,006 23	
Less Dividend paid Feb. 1, 1892	54,599 88	
		$ 6,406 35
Net earnings, 1892		475,137 61
		$481,543 96

E. & O. E.

NEW YORK, December 31st, 1892.

JOS. WILLIAMS,
Treasurer.

THE EDISON ELECTRIC ILLUMINATING COMPANY

OF NEW YORK.

DR. CONDENSED BALANCE SHEET, DECEMBER 31, 1892. CR.

License under Edison Patents		$3,020,000 00
Real Estate, Construction and Property, and other Investment Accounts	$5,119,965 78	
11,164 Shares Edison Light & Power Installation Co.	1,116,400 00	
683 Shares New York Electric Equipment Co.	68,300 00	
		6,304,665 78
Customers' Accounts		143,796 40
Sundry Accounts and Supplies on hand		89,052 51
Cash on hand		33,736 17
		$9,591,250 86

Capital Stock	$6,500,000	
Less Installment due Feb. 3, '93,	400,000	$6,100,000 00
First Mtge. Covertible 5% Bonds		3,100,000 00
Bills and Accounts Payable		136,837 65
Sundry Accounts		2,532 11
Dividend No. 31, (due Feb. 1, '93)		66,567 50
Reserve Fund		82,355 78
Accrued Interest		51,666 67
Profit and Loss		51,291 15
		$9,591,250 86

E. & O. E.

NEW YORK, December 31st, 1892.

JOS. WILLIAMS,

Treasurer.

First Vice-President's Report.

New York, 10th January, 1893.

Spencer Trask, Esq., President,—

THE EDISON ELECTRIC ILLUMINATING COMPANY OF NEW YORK.

Sir:

The year 1892 closed with a record of business outreaching the remarkable results shown in 1891.

Between December 31, 1891, and December 31, 1892, the number of customers of the Company had increased 51% (2,875 to 4,344), the installation of incandescent lamps 50% (94,485 to 142,492), of arc lights 94% (841 to 1,637), and of motors 90% (2,000 h. p. to 3,807 h. p.), the total installation, including arc lights and motors, 60%, (the equivalent of 122,895 16 c. p., to the equivalent of 196,932 16 c. p. lamps).

The following table shows the actual increase in the several classes of installation for the past three years:

	Dec. 31, 1889.	Dec 31, 1890.	Increase, 1890.	Dec. 31, 1891.	Increase, 1891.	Dec. 31, 1892.	Increase, 1892.
Customers.....	1,213	1,698	485	2,875	1,177	4,344	1,469
Inc. Lamps.....	39,815	64,174	24,359	94,485	30,311	142,492	48,007
Arc Lights.....	77	254	177	841	587	1,637	796
Motors h. p.....	421	697	276	2,000	1,303	3,807	1,807
Tot. 16 c. p. eq....	44,795	73,684	28,889	122,895	49,211	196,932	74,037

The year shows a correspondingly satisfactory financial result, as is evidenced by the Treasurer's Report submitted herewith. Two facts have, however, combined to make the percentage of earnings to capital lower, and the percentage of operating expenses to gross earnings higher than they will normally be: (1) Large investments of capital have necessarily been made at this period of the Company's development in the purchase of land, in the erection of buildings, and in the extension of the underground system to provide for future business, which expenditures are not yet yielding returns in full proportion to the amount of the investments actually made; (2) The

delays of the General Electric Company in supplying the new dynamos at the times contracted for have caused the operating department to be worked under very great disadvantage. Unless further and most abnormal delays occur, as to the new machinery, the Company during the coming year will be in much better shape as to economy of operation than ever before, and it will also be utilizing an increasing proportion of its invested capital, with but moderate increase in new investment, although a considerable part of its investment will for some time remain a provision for the future.

The Electrical Situation.

The electrical situation in the City of New York to-day is peculiarly favorable to this Company. This Company is now the largest local electric illuminating company in the world, the total installation supplied by it being about 50% larger than that of the Berlin Company, which is next in order; and it does approximately 50% more business than the total of all other local electric illuminating companies, of which there are now seven—the United Electric Light & Power Company (Westinghouse system), the Brush Company (controlled by the first-named), the Thomson-Houston Company, (formerly the East River Company), the Mount Morris Company, the North River Company, the Manhattan Company, and the Harlem Company—all of them operating high tension systems. The two companies last named, whose installations are the largest in the northeastern portion of Manhattan Island—a field not yet occupied by either the Edison Company or the competing high tension companies to any considerable extent—are now controlled by the Edison interests, a large part of the stock of each being in the hands of the Edison Installation Company. These companies also extend to the southern portion of the city and are capable of further extensions in that direction, should such developments prove desirable. In view of the declared policy of this Company, of supplying current at prices which will decrease from time to time as the growth of the demand and of the supply permits, and thus giving the public its share of the benefit from the relative decrease in operating expenses and the cost of current, the situation is a happy one one for the public as well as for the Edison interests.

I beg to repeat to you the opinion heretofore expressed, which has met with the general approval of yourself and of other directors, that the wise course for this Company to pursue in the future is at each increase of dividend to its stockholders to make a decrease in the price for current to the public, on such a scale that while the total net return for any one year will not be decreased, the stimulus given to the business will show itself positively in an increased net return for the succeeding year. As soon as the new machinery which we are developing is in place, so that we can supply more current than is demanded at the moment, it should be practicable to take a further step in this direction.

The Lamp Decision.

The Edison supremacy in the electrical situation is confirmed by the final lamp decision. After many years of litigation, rendered most costly by the tenacity of the infringing interests, Mr. Edison's claims as the inventor of the incandescent lamp were fully upheld by the opinion of Judge Wallace in the United States Circuit Court, July 14, 1891, and the decision of Judges Lacombe and Shipman, October 4, 1892, in the United States Circuit Court of Appeals, confirming the decision of Judge Wallace. The decisions clearly set forth that incandescent lighting has been made commercially possible by Mr. Edison's invention, his patent being absolutely sustained. The genius which had developed, in connection with the old Pearl Street installations of this Company, a complete system of electric lighting, from the dynamo to the lamp, commercially practicable throughout, including the mains and feeder system, the meter, and the sockets, as well as other devices, was at last fully vindicated in its most important single invention ; and it was clearly shown that every other incandescent lighting company had been built up upon an infringement of the rights of the Edison companies, for which rights they had expended large sums, and which the infringing companies sought to use without payment. Every incandescent lamp other than the Edison type, used in our territory from the beginning, has been in violation of our rights, and no other lamp can be used without defiance of the courts. Since the decision, as before, there have been numerous announcements of non-infringing lamps, mostly of the "stop-

per" type announced many years ago, but the date for their delivery has been as often postponed, and any practical non-infringing lamp has yet to be seen by its own light. The American decision is in accord with the English decisions, upholding Mr. Edison's rights in England, where (since the combination of the Swan interest with the Edison) the "Ediswan" is the one lamp legally saleable. Mr. Edison's comprehensive, patents on sockets for incandescent lamps is next to be maintained in the courts, many infringing devices having been put on the market in adaptation of his original idea.

The History of the Company.

The development of this Company has now reached a point at which a summary of its past history should be put on record. The Edison Electric Illuminating Company of New York, organized by the filing of its certificate Dec. 17th, 1880, was the first company to begin commercial electric lighting on a permanent basis. The parent company, the Edison Electric Light Company, of which this Company was and is the local licensee, had been organized Oct. 16, 1878, and early in 1881, Mr. Edison took the building, 65 Fifth Avenue, in which both Companies for some time had their general offices, under the executive direction of Major S. B. Eaton. The Edison Company for Isolated Lighting, organized Nov. 19, 1881, and the Edison United Manufacturing Company, organized a year or two later, also had their offices at 65 Fifth Avenue, after the Illuminating Company had moved its office thence, which fact led to considerable confusion later on in the minds of customers as to the responsibility of this Company for wiring work. Bulletin No. 1 of the Light Company, issued from 65 Fifth Avenue, Jan. 26, 1882, announced the plans for "lighting up New York City."

The Edison Illuminating Company purchased the Pearl street property in May, 1881, and it commenced the preliminary work of laying street mains and of wiring houses in July, 1881, having a construction office in Ann street. July 5th, 1882, dynamos were run for testing purposes, and on Sept. 4th, 1882, at 3 p. m., the Pearl street station was started, having then six "mammoth steam dynamos" of 125 h. p. each, for the supply of

current to customers, lighting during the first month 85 houses, wired for 2,323 lamps. It ran continuously, with a break of but three hours in 1883, until the fire on January 2, 1890. The original street mains were all on the two-wire system, and the early house installations would now be considered very crude. There is probably not a single house installation existing intact to-day in its original shape. At the start, a small junction box was placed in the sidewalk before each house, for the purpose of cutting off the current from outside, but this plan was found undesirable ; a few of these boxes still exist, but they have never been used. The first installations were made on a conditional arrangement that each customer was to have the use of the current free for a week, and if the light proved satisfactory to him he was then to pay the cost of the wiring equipment. 946 houses had been wired at the beginning, with a capacity of 14,311 lamps, but only a portion of these were actually connected with the street mains.

The equipment of the Pearl street station and the development of the installation work in connection with it were the scenes of Mr. Edison's first personal labors in this field, and day and night, for many months, the work had his direct supervision. The assistant electricians had a bedroom in the old station, but Mr. Edison's bed was commonly a pile of tubing with a few coats thrown over. That station trained in its early days many of the men who have since made their mark in electric lighting, outside the Company as well as within it :—John Leib, now chief engineer of the Italian Edison Company, who left the New York company to start the first European station in Milan, which is still under his charge ; S. S. Wheeler, now the electrician of the Board of Electrical Control ; Charles S. Bradley, the electrical expert of the Fort Wayne-Jenney Electric Company ; Chas. L. Clarke, the well-known electrical engineer, and others outside, as well as H. J. Smith, the present General Operating Superintendent of this Company, and H. A. Campbell, Superintendent of the Down-town District. John Kruesi, the present manager of the Schenectady Works, who had developed the Kruesi insulating compound for the Edison tubing, made the tubing at a little factory in Washington street and supervised its installation, and Mr. Greenfield,

now of the Interior Conduit & Insulation Co., superintended the wiring installation.

The first President of the Company was Dr. Norvin Green, now of the Western Union Telegraph Company, Major S. B. Eaton, counsel of the Company, being the Vice-President and working executive, and the first Superintendent of the station was Mr. Casho, now in the business of engine-building in Connecticut.

At the beginning of the year 1883, by which time the Company was fairly under way, the dynamos in the Pearl street station were supplying about 300 customers with about 6,000 incandescent lamps, neither the motor business nor arc lighting having yet been developed on the system. One of these dynamos, now known as the historic "Jumbo," survived the Pearl street fire, and will form a part of Mr. Edison's historical exhibit at the Chicago Fair.

The original underground two-wire system installation in the Pearl street district included 4 miles of feeders and 9½ miles of mains, covering about a square mile of territory, extending from Wall street to Spruce and Ferry streets, and from Nassau street to the East River. The farthest supply was about 3,000 feet. The successive Presidents of the Company, after Dr. Green, were Major S. B. Eaton, as acting President, Spencer Trask, and during the latter's absence in Europe, Geo. Foster Peabody. The successive Superintendents of the Pearl street station and the original district, after Mr. Casho, were C. E. Chinnock, John I. Beggs, who, with the development of the Company uptown, became its Vice-President and General Manager, and H. J. Smith, H. A. Campbell taking practical charge of the station as Assistant Superintendent on Mr. Smith's becoming General Operating Superintendent.

The first Board of Directors included Messrs. Norvin Green (President), Tracy R. Edson, James H. Banker, Robert L. Cutting, Jr., Grosvenor P. Lowrey, Robert M. Gallaway, Egisto P. Fabbri (Treasurer), Dr. James O. Green, Jose F. de Navarro, Henry Villard, Nathan G. Miller, T. A. Edison and Sherburne B. Eaton (Vice-President). Calvin Goddard was the first Secretary.

The important development of the Company occurred when it was decided, in 1887, that the success of the Company justified its extension into the uptown districts. Property was purchased

for the new Stations in 26th Street and in 39th Street, and the work of erecting the stations was commenced in the summer of 1887. Simultaneously the new 3-wire system of feeders and mains was laid underground. It was then the policy of the Company to complete stations and equipment before beginning to deliver current, so that it was not until Thanksgiving Day, 1888, that current was delivered from the 39th Street station, and Christmas Day, 1888, from the 26th Street station, neither being fully under way until the first part of 1889. At the close of 1888 the Company had on its records 710 customers and 16,377 incandescent lights. The first motor had been put on the system in the downtown district in the fall of 1884, and the first low-tension arc light had been connected with the system uptown in the spring of 1889. The development of the uptown system has been continuous and most satisfactory since that date. The general office of the Company during this period was at 432 Fifth Avenue. In connection with the up-town work, a Wiring Department was organized in 1889, with headquarters at 431 Fifth Avenue, across the street.

Meantime the downtown business had been developing, and from September, 1886, through April, 1891, a small annex station was run in a basement in Liberty street to help out the Pearl station. On January 2, 1890, at 6:10 a. m., occurred the street fire which entirely destroyed the Pearl street station, with the exception of the boilers and one of the dynamos, already referred to. The supply of current was, however, interrupted for less than half a day, at the end of which time the Liberty street annex was supplying current independently throughout the entire district, under arrangement with certain customers that they should draw only to a limited extent for their requirements. By vigorous work and the hearty coöperation of Mr. Kruesi, Mr. Turner and others of the Schenectady works, the station was partially rebuilt and new machinery installed so that at 9 p. m. on January 12 current was again supplied from the Pearl street station without the loss of a single customer. The Pearl street station was at best but a makeshift building, having been adapted for its new purposes from old buildings found on the site, and it had for sometime been an object of anxiety to the officers of the Company.

It was evident that the possibilities of demand for electric

lighting in the lower part of the city had not, however, been fully appreciated, and it was determined, therefore, by the Company, to erect a new station on much larger plans than had before been considered feasible. The site of the present Elm street station was accordingly purchased from the A. T. Stewart estate late in July, 1890, and as soon as possession could be obtained, on the first of August, the work of demolishing the old buildings and making excavations for the new building was commenced. On the 1st of May, 1891, without waiting for the completion of the building, a temporary station was set up in the part then made ready and current was supplied from the new station, the annex station in Liberty street being discontinued. Meantime, an annex station of more permanent character had been arranged for at the Produce Exchange, which has been satisfactorily worked in connection with the steam plant of the exchange itself.

Stations and Equipment.

The new station at Pearl and Elm streets, for which land was purchased July, 1890, and ground broken August, 1890, from which current was turned on May 1st, 1891, and which was occupied October, 1891, by the general offices, has been developed during the year by extending the construction of the main and second stories to the Duane street front. All the work has been completed on that extension except the facade itself, which has been delayed because of the New England granite-cutters' strike, extending through the summer and fall of 1892. The granite for this front has now reached New York and the work will be completed during the present winter, as early as the temperature permits. The main story of this extension has been utilized temporarily as the boiler room, and the meter departments have been removed from the 26th street and old Pearl street stations and concentrated in a part of the second story. The delay in obtaining the multipolar dynamos required makeshift arrangements at the new station, which resulted practically in running what may be called three stations on the same property, one consisting of the new large units and some smaller multipolars and bi-polars in the engine-room proper, the large units being a part of the permanent construction ; another con-

sisting of two smaller bi-polar units in the basement below ; and another of small and large bi-polar units in the yard alongside on Elm street, which was taken from the underground division and transferred to the operating department as a last resort. This station in the yard is all of machinery temporarily purchased to meet the exigencies of the situation, but it has developed nearly to the capacity of the old Pearl street station. It will be disposed of as soon as the starting of the first 1250 h. p. unit and the installation of the second unit of that size make that course safe, in time to use the yard as a basis from which to handle the material for the building of the upper part of the new station. This complexity of operation and the handling of coal for the several boilers, also temporarily installed wherever place could be found for them, has added greatly to the expense of operating at the new station. With the completion of the two new 1250 h. p. units during the present spring, it will be practicable to run the old Pearl street station as an annex with but one shift, and by summer to give it up altogether, although it may prove desirable to keep the machinery in place until it is absolutely certain that the yet larger unit of 2500 h. p. ordered during the past year will be ready for installation at the contract date, August, 1893.

The business of the Company in the down town district has developed so rapidly that it is necessary to commence work promptly with the spring on the completion of the new station by carrying it up to the full height intended for station purposes, possibly leaving the question of additional stories for office and power purposes an open one till another year.

The old Pearl Street station has, as heretofore, done its full duty during the year, and the Produce Exchange annex has been of the utmost service.

The equipment of the 26th Street station has been considerably extended during the year by the addition of a second 600 h. p. unit, and of a new compound engine with a pair of No. 32 bi-polar dynamos, and the installation of three new boilers. A third 600 h. p. unit and two more boilers, which will probably be installed during the spring, will complete the equipment of this station, but it is probable that it may then be desirable to replace the high speed small engines with large units of the new type, thus considerably increasing the generating power of the equipment.

No new development has been made at the 39th Street station, in view of its nearness to the 26th Street station.

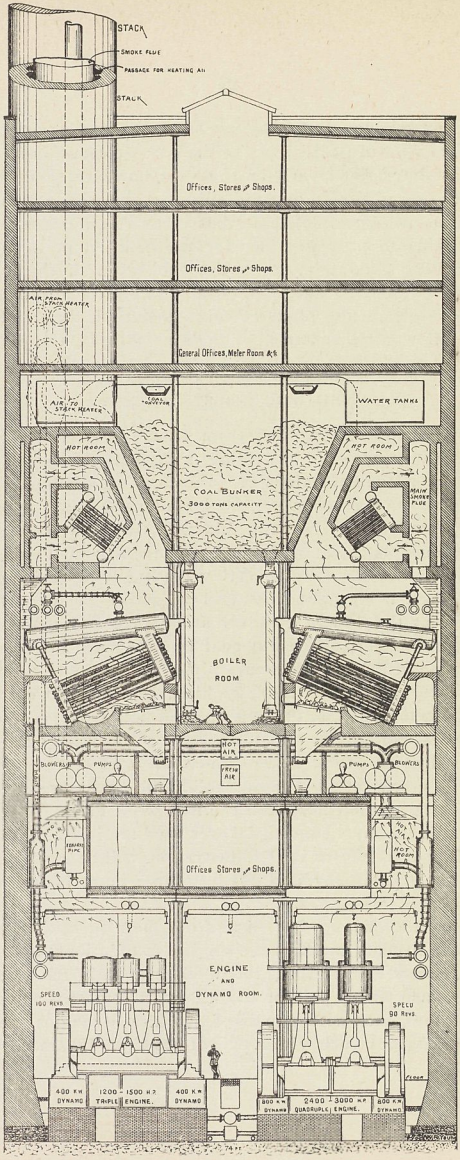
It was determined early in the year, however, to utilize the property on 53d Street, and the engine-room with a temporary facade has been completed at that station at a low expense, in such wise as to provide either for the erection of a complete station there ultimately, or for the utilization of the building for other purposes. The engine-room serves for the time being to house a generating plant of fair capacity, including boilers, and the first unit was started at the very close of the year 1892.

New Elm Street Station.

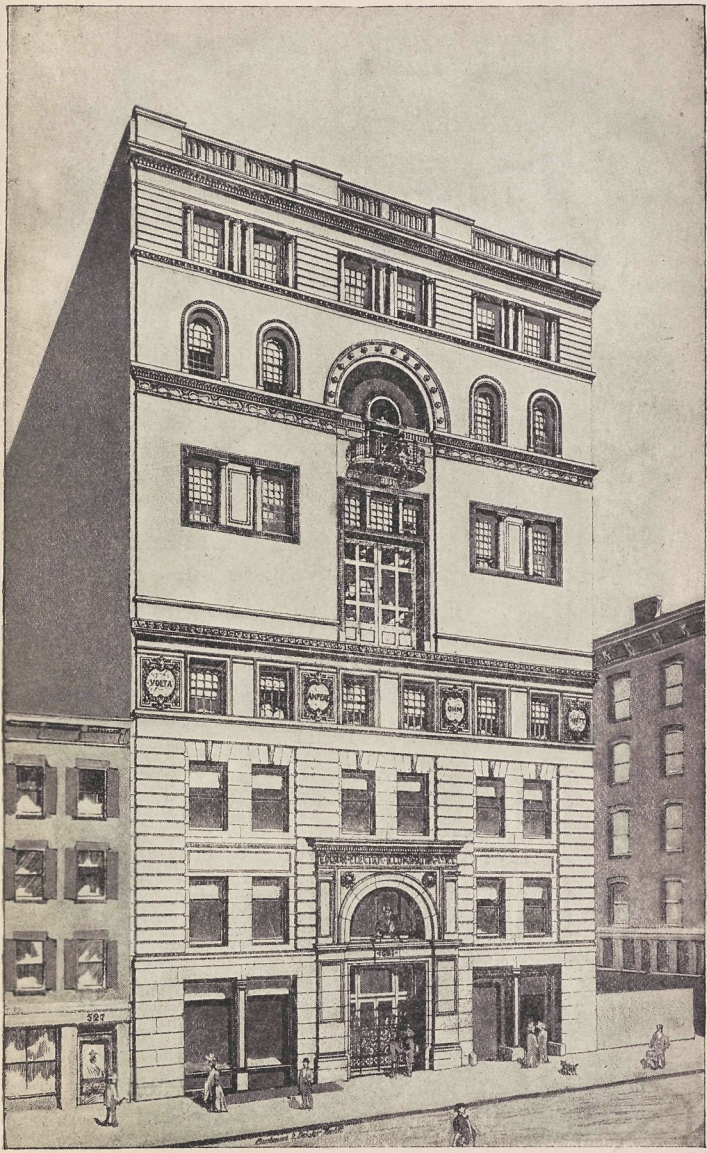
The new station, extending from Duane to Pearl Street, next Elm, is noteworthy for providing a capacity of nearly 30,000 horse-power (the equivalent of 300,000 16 candle-power lamps burning at once, or over 400,000 installation) upon ground 74 feet by about 200. The central idea has been to replace land engineering practices by marine engineering methods, as a necessity for an electric generating plant on expensive ground in the heart of a great city, and to attain the very highest efficiency at the lowest cost for attendance and maintenance. The problems as to space and coal economy are in fact essentially those of the modern steamship.

The structure, a model of its kind, is composed entirely of brick, granite and iron ; the lower part of both fronts is of dressed granite extending the full thickness of the walls ; the upper part of dressed brick and terra-cotta, ornamented throughout with electrical forms ; the solid side walls are 4 feet 10 inches thick at their base, and the iron work inside, of Phoenix columns, is the most substantial ever used in New York. Above the building, as shown in the illustration, will be a story for the offices of the Company, and possibly three more for power and office uses.

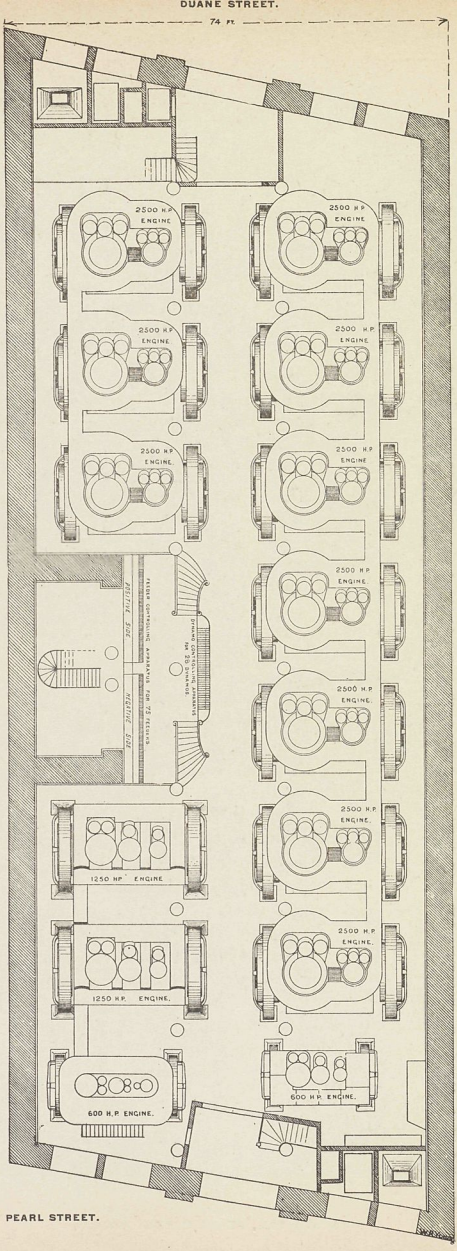
The main floor is 30 feet high from floor to ceiling, with 10 feet space beneath the floor for engine foundations, condensers, piping, cables, etc., and it is intended to contain ten 2,500 h. p. engines, each with a pair of 800 kilo-watt dynamos ; two 1,250 h. p. engines, each with a pair of 400 k.-w. dynamos, and two 600 h. p. engines, each with a pair of 200 k.-w. dynamos. In the



SECTIONAL PLAN OF NEW STATION.



NEW STATION, PEARL STREET FRONT.



ENGINE ROOM OF NEW STATION.

centre of the eastern side wall will be the electrical gallery for the control of the feeders and of the dynamos, with volt meters and ampere meters so large that they can be seen across the station, and a glassed gallery at the Pearl Street end affords the station Superintendent a view over the whole room. Above the main floor is a second floor for shops and stores, with a space of ten feet wide divided off on each side for the steam pipes, and for collecting the hot air of the engine room to be sent to the stacks and there super-heated for the boiler furnaces. The third floor is for the blowers, pumps, ash conveyers, air ducts, etc., beneath the boilers. The fourth floor, following the practice originated in the uptown stations, is the boiler room, providing for thirty separate boilers ranged on both sides, with a central passage way for firing. The boilers will be of steel, on the safety water tube principle, for at least 200 lbs. working pressure, extra long and extra high, with proportionately extended grate area to obtain the greatest steaming power from the least possible floor space, and they will develop steam for 20,000 h. p. (of multi-expansion engines at 15 lbs. per h. p.,) and with forced draft for 30,000 h. p. The fifth floor provides for the coal bunkers, approximating 3,000 tons capacity, under whose sloping sides will be the main smoke flues with feed-water economizers, and above these water storage tanks. Continuous coal conveyers will bring coal from two hoppers at each street front, for use alternately for receiving and weighing the coal and for discharging into the conveyers, and these, after emptying the coal into the bunkers, will return under the boilers, carrying the ashes down—arrangements being made that the carts which bring the coal shall take a load of ashes to the dump on the return trip. The office floor will be above the coal bunkers, reached by elevators and stairways from each front, and from the eastern wall will rise the two huge smokestacks of brick and steel, so arranged that the hot gases will be utilized to heat the air furnishing the draft for the boilers. The plans for forced draft and for utilizing the hot air can be thrown out of service at a moment's notice, and the whole system is so arranged as to be interconvertible, and to permit of promptly throwing out of use for repair. The whole system will run at the highest economy during ordinary loads, while for the hour or two of maximum load, or in emergencies, the whole or

any part can be forced fifty per cent. or more above rated capacity, thus saving the investment of so much additional capital. These features of the building are shown in the sectional plan.

New Engines.

The new engines are all of the multi-expansion inverted cylinder marine type, developed according to specifications prepared for this Company by John Van Vleck, its Chief Electrician and Consulting Engineer, after extended personal investigation in Europe and this country, and with the aid of the Staff Council of this Company. They have been developed under these specifications by the Dickson Manufacturing Company, Scranton, Pennsylvania, to which this Company is indebted for its admirable work, and particularly with the co-operation of John W. Sargent, recently consulting engineer of that company. By placing the steam chests on the front, instead of between the cylinders, the engines are made thirty per cent. shorter than other types, and,coupled with direct-driven dynamos, the larger units occupy only about one-tenth the space required for electrical generating under old conditions. The regulating and valve gear is also placed on and operated from the front of the engine ; the valves are positive, driven by the Joy valve gear, avoiding any change in point of cut-off produced by valve friction, as is usual when centrifugal governors are placed on the main shaft ; the governor is an extra powerful one of the Porter Allen type, controlling all three cylinders by means of a hydraulic cylinder ; the point of cut-off is automatically controlled on all three cylinders, causing the engine to respond quickly to the governor ; and the point of cut-off on each cylinder is indicated on a dial, and can be varied at will even while the engine is in motion. The speed of the engine can thus be varied while running, an important feature especially useful in providing higher electric pressure for an auxiliary 'bus. Disconnective piping makes it practicable to run the engine with any of its cylinders thrown out of gear, and the shaft in the large engines is arranged so that either side can be disconnected from the other, permitting one part of the engine to run as a compound, while the other is disabled or under repair. The main engine bearings are of ample size and of an improved construction,

enabling the bottom boxes to be removed without lifting up the shaft, which permits repairs to be made without disturbing the enormous armatures of the multipolar dynamos. Cylinder covers and piston heads are of cast steel, of the cone type, and throughout the general construction is up to the most modern marine practice. All engines are calculated for 200 lbs. initial pressure, and can be run safely even higher. The complete oiling and drip system, with relief valves, and the other arrangements reduce the cost of attendance to a minimum. The cylinders are so proportioned that the engine can be used either condensing or non-condensing.

Of this type of engine, known as the Van Vleck Disconnective Engine, one triple-expansion 600 h. p. engine is in use at the new station, and two at the 26th Street station ; a fourth is building for the latter. These units are 13 feet 3 inches long over bearings, 8 feet 2 inches wide, and 15 feet 6 inches in extreme height. The cylinders are 18, 27, and 40 inches in diameter, with 30 inch stroke. The wrought iron shaft is 8 inches in diameter, and the speed is 120 revolutions. These engines carry a pair of 200 k. w. dynamos, fitted at either end of the shaft, supplying together 3,000 amperes.

One triple-expansion 1250 h. p. engine of this type has been ready to run at the Elm street station since October last, awaiting the pair of 400 k. w. dynamos which is now being fitted to it ; a second has been ready for delivery at the same station as soon as the other unit should be running. There units are 19 feet 6 inches long over bearings, 12 feet wide at the base, and 19 feet 9 inches in extreme height. The cylinders are 24, 35 and 52 inches in diameter, with 36 inch stroke. The wrought-iron shaft is 12 inches in diameter and the speed is 100 revolutions. These engines carry a pair of 400 k. w. dynamos, together supplying over 6,000 amperes. The 1250 h. p. engine is furnished with starting valves attached to the intermediate and low-pressure cylinders for use in case the high-pressure cylinder is on dead centre ; and a worm wheel and ratchet is also attached to enable the engine to be turned over by hand.

The main equipment of the new station will be of the 2500 h. p. engine, of which there will be room for ten. The first of these is now being manufactured by the Dickson Manufacturing Company, to be delivered ready to run in the Elm street station

in August, 1893. This is a quadruple-expansion engine, two-crank, with tandem cylinders, which last feature gives it floor dimensions smaller than the 1250 h. p. three-crank engine. These units will be 17 feet 9 inches long over bearings, 13 feet 8 inches wide, 24 feet 11 inches in extreme height. The cylinders will be 26, 37, 52 and 72 inches in diameter, with 36 inch stroke, the high-pressure being above and tandem with the first-intermediate, and the second-intermediate above and in tandem with the low-pressure cylinders. The shaft of hammered open-hearth steel will be 16 inches and 18 inches in diameter, bored hollow. The engine is built to develop 2500 h. p. at 90 revolutions, but to run safely at 100 revolutions. The steam chests at the front are so placed that the lower valves can be removed without disturbing the upper valves, and throughout easy handling and repair of the engine has been a first consideration. This engine carries a pair of 800 k. w. dynamos, fitted on each end of the shaft, supplying together at least 12,500 amperes. One of these units will develop twice the electrical capacity of the entire old Pearl street station in about one-tenth the floor space and with a third of the attendance required under the old system, and it is believed that with it the highest results attainable in the present state of engineering will have been reached.

Electrical Equipment.

The dynamos provided for the new engines are all of the new multipolar type, direct-driven from the engine shaft, avoiding belting, and are of the external yoke or Gramme type which for some years has been a favorite in European practice. Their improvement on the European type, in having no separate commutator or "out-board" bearing, effects a considerable saving in floor space. These machines, as built by the Edison works at Schenectady, are of exceptionally good design and have given the most satisfactory results.

All the dynamos in the new station will be controlled from an electrical gallery placed against the supports for the smoke-stacks, near the centre of the engine room, a few steps above its floor. The main feeder-controlling switchboard will be at the back of this gallery and will be constructed for operating seventy-five feeders within a length of forty feet, including a

doorway through the centre. The mechanism for each feeder will have 1,500 ampere capacity, and each entire feeder unit, including the main resistance switches, the ampere meters and the pressure indicators, will take up a space only three inches wide—a concentration of electrical apparatus hitherto unapproached. Back of this switch-board will be the feeder resistances, each feeder having three, which can be inserted in circuit for feeder regulation. At the front of the electrical gallery will be placed the dynamo-controlling apparatus, with a main ampere meter having a capacity for 100,000 amperes on each side, probably on the same principle as the ampere meters of 30,000 ampere capacity on each side now being built at the works of James White & Co., Glasgow, for the 26th Street station. The main volt meters, also under construction there, will be two feet in diameter, so that the pressure can be noted from any part of the room.

Operating Department.

The Operating Department, despite the disadvantages under which it has worked during the year, has accomplished remarkable results. During the entire fall and early winter every resource of ingenuity was necessary to keep the supply of current up to the demands of our customers, which was done without accident or interruption, except that an overload of the feeders running south from the 26th Street station caused a brief interruption on one side of the system in a small portion of the district for a part of an evening, and that there was some ground of complaint from customers in specific parts of the city where the voltage dropped on several occasions at a time of maximum load on dark or heavy days. Every precaution within the control of this Company was taken to avoid such difficulties, and it is gratifying that the constant attention on the part of the operating chiefs prevented any more serious result from the lack of electrical machinery, contracted for delivery early in the fall but not delivered to us until weeks or months after the contract date. Small engines and bi-polar dynamos were obtained from time to time to meet the weekly increase of load, to the full extent of available machinery in the market, and under the difficulties facing those responsible for the conduct of

the Company during that period, the results have been at least creditable. In addition to the ordinary work of operating, the department has had upon it an unusual burden both in permanent construction work and in installing the smaller machinery used to make temporary provision for the demand, and especial credit is therefore due to the General Operating Superintendent, H. J. Smith, and the Assistant Superintendent of the First District, Mr. H. A. Campbell, who is specially in charge of construction at the down-town station. Mr. Campbell, who is one of the earliest employes of the Company, has been promoted to the position of full Station Superintendent as a deserved recognition of his services during this year.

The down-town district, including the new central station, the old Pearl street station and the Produce Exchange annex, reached during the year the maximum load of 21,000 amperes, December 15th, the equivalent of over 45,000 16 c. p. lamps burning at one time. The best average of the year was 7,906 amperes, December 13th. The maximum output of this district in 1891 was 13,550 amperes; in 1890, 8,340 amperes, and in 1889, 7,520 amperes. Its best daily average was in 1891, 5,200 amperes; in 1890, 3,382 amperes; and in 1889, 2,760 amperes. The uptown district, including the 26th street station, the 39th street station run as an annex, and the 58th street temporary annex, reached during the year a maximum output of 20,320 amperes, December 14th, the equivalent of over 44,000 16 c. p. lamps burning at one time. The best daily average of the year was 7,473 amperes, December 20th. The maximum output of this district in 1891 was 15,100 amperes; in 1890, 9,045 amperes, and in 1889, 5,155 amperes. Its best daily average was in 1891, 7,300 amperes; in 1890, 3,142 amperes; in 1889, 1,791 amperes.

At the individual stations the maximum load of the year was reached at the Produce Exchange annex on August 31st with 2,900 amperes; at the old Pearl street station, December 21st, with 6,450 amperes; and at the new central station, December 15th, with 11,900; at the 26th street station, December 21st, with 15,225 amperes; at the 39th street station, November 19th, with 5,600 amperes; at the 58th street annex, December 10th, with 880 amperes. This shows a total working capacity of all stations during the fall and winter of 42,955 amperes, each station having

been put to its best to deliver the amperage recorded. The highest load on the entire system taken together was on December 15th, a maximum of 40,755 amperes. The best average of the entire system was Dec. 13th, 15,204 amperes. The minimum load in the downtown district was on May 29th and August 28th, 300 amperes, and in the uptown district, July 18th, 450 amperes. The total ampereage of the year reached the enormous amount of 70,293,050 ampere hours.

The plan of operating one station only in the downtown district and one station only in the uptown district as a continuous station, and using the other stations as an annex for one shift only has worked most successfully during the entire year. For a short period of the highest load in the holiday season 39th street station was run as an annex of two shifts for sixteen out of the twenty-four hours.

The old Pearl street station and the Produce Exchange annex downtown, and the 39th street station annex uptown remain with the same electrical capacity as heretofore. The new central station downtown has a capacity of 26,950 amperes, which will be increased to 38,550 amperes within January. The 26th Street station has a capacity of 16,200 amperes, which will be increased to 19,100 amperes early in the year ; the new 53d Street annex has, with generating units and storage battery, a capacity of 1,800 amperes for the hour.

The present provision of machinery is ample to cover the growth of the Company's business until next fall, and every precaution has been taken in regard to the new large unit downtown, due in August, to avoid the delays of the past year. The capacity of the 26th Street station reaches its limit with the engine soon to be installed, until it is decided to replace the small high speed engines with the triple expansion units ; but the small machinery down-town will be transferred to the extreme up-town stations, and ample provision thus made in that part of the city.

Installation Department :—Underground Division.

The mileage of underground conductors has been greatly increased during the year 1892. The system has been extended along Madison Avenue to 79th Street (permit for Fifth Avenue

to that point having been laid over until this year), and in the north and south streets on either side of Broadway, so that with feeders and mains there are four or more possible channels of connection between the up-town and the down-town system. Special attention has also been given to the extension of the feeder system, and one of the largest size feeders has been carried from the new central station as far as 8th street, where it reaches a junction box which is also connected by feeder with the 26th street station. In this way a continuous feeder line can be established at any moment from the Elm street station to the 39th street station, while this feeder can at any time be used as a feeder within or across the districts. That portion of the city between the Battery and Central Park is now thoroughly outlined by our system as far east and west from Broadway and Fifth Avenue as the lighting prospects have justified, and a number of the cross streets in the middle as well as in the lower and upper parts of the city are now on our system.

During the year 14.29 miles of mains and 4.84 miles of feeders were laid in the down-town district, making a total on December 31st, 1892, of 71.78 miles ; 7.82 miles of mains and 5.86 miles of feeders in the up-town district, making a total, December 31st, 1892, of 99.81 miles. The new construction occupied 112,440 feet of street trench.

The total mileage of street conductors in all the districts on December 31st, 1892, was 141.23 miles, and during the year, as above reported, 32.80 miles of feeders and mains have been built, making a total December 31st, 1892, of 171.59 miles. This result includes allowances for the two-wire system still existing, confined to the old down-town district, and now run on the three-wire plan, which amounts only to 2.10 miles of mains and 4.27 miles of feeders, a total remaining of only 6.37 miles of two-wire tubing, all of which, except possibly some portions of the feeders, it is intended to replace by three-wire tubing during the present year. During the year 188 junction boxes have been set, making the total 458 down-town and 546 up-town, in all 1004.

Within the year a careful table has been compiled showing the development of the Edison underground system from the beginning, so far as it can accurately be traced. The records of the early years were not accurately kept, and many of the down-

town records were destroyed in the Pearl Street fire. The mileage of the system has been from time to time computed in various ways, *e. g.*, by the amount of tubing purchased for use (disregarding the actual waste in laying) ; by the amount of tubing actually laid in streets (disregarding replacements and junction boxes) ; or by the actual tubing in streets, as shown by maps and records, counting each duct as extending to the center of the junction box, through which it makes connection with the tubing at the street intersections. The table referred to, and the statistics of the Company from this date, are based on the latter method, errors found in previous tables having been corrected by careful comparison with the different sets of records, so that a basis for future calculations and measurements could be assured. The department is now organized to make the most careful and detailed records from year to year.

The number of service connections placed by the underground division during the year amounts to 1,214 services or house connections, in addition to which 113 stubs have been led under the curb, so that house installations may be made without taking up street pavements. A part of the services have been taken from the main by replacing the ordinary coupling boxes with T boxes, at considerable expense because of the charges for replacing pavement. A considerable portion, however, have been taken, without interfering with the pavements, from the stubs led out from the mains in previous years, according to the practice now generally adopted, especially in streets that are to be repaved. The Company has now adopted a general policy, in the case of streets which are to be repaved, of leading out stubs at every other house, along the line of the main, or of laying the mains themselves so close to the curb that they can be reached from under the sidewalk without interference with the pavement. This practice has become the settled rule of the Company in all cases where the condition of the streets admits, and is in harmony with the policy of the Department of Public Works to minimize interference with new pavements.

During the year the map and record bureau of this division has been developed in its organization, and especial credit should be given to Mr. Johonnot, the senior draughtsman, and to Mr. Elder and Mr. Engelhardt, his principal assistants, for the amount and quality of work which their skill has pro-

duced. An atlas has been begun on a large scale, which will show, when completed, the entire street system of the Company to its most minute detail, and in this atlas changes, with their date, will be recorded from time to time. The patented method developed by Mr. Elder of making a negative on which corrections can be made from day to day, either by erasure or addition, has proved of the greatest service by enabling the Company to furnish to wiring contractors and others having occasion to know the location of street mains, blue-print standard maps showing the system as it stands at the very date of making the blue-print. A similar map of the feeder system has been made for the use of the officers of the Company. An historical atlas of the Company's development has also been begun, and to this report is appended reduced copies of maps showing the original down-town system of 1883, the original up-town system as it stood in 1889, and also the entire system as it stood at the close of the years 1890, 1891, and 1892.

The work of testing out the underground system by block-faces, commenced at the beginning of the year, has been carried out throughout the year, and the insulation test, as tabulated, shows a very satisfactory condition of the system throughout the city, with the exception of portions of the old two-wire system, which it is expected to replace this year. To keep the record of these insulation tests in proper shape, a card system was devised, giving a card to each block-face. On this card is recorded the date and hour of the test, the weather and temperature at the time, the electrical pressure at the junction box, and the insulation of each conductor from each other conductor, and from ground. Data have now been obtained for nearly all the block-faces of the system except where junction boxes could not be reached because of obstructions by the cable road or other building operations, or because no hour could be found at which customers could be disconnected, chiefly by reason of the use of motors for mechanical purposes on those block-faces. The method employed was to cut off all house connections by sending an inspector along the block for that purpose after due notification to customers ; then to open the junction boxes at the two ends of the block-faces, and then to make electrical tests by portable electrical bridge and galvanometer. It has been proved that the insula-

tion of the system is, on the whole, very high, with the exceptions of the cases above noted and of certain portions of the neutral tubing, some of which were low, and a few of which were practically grounded. The low insulation of the neutral was not of importance while the neutral wire was purposely grounded at the junction boxes. The underground divison was, however, instructed not only to replace all the tubing showing low insulations of positive and negative wires, but to correct neutral faults also as far as practicable, which last work it is hoped to complete early in the next open season. During the progress of this testing the junction boxes were put in thoroughly good condition, and the neutral was disconnected from the ground at all junction boxes, except those at feeder-ends, as the work proceeded. In accordance with later instructions, the neutral was disconnected from grounds at all the feeder-end boxes also, so that at the beginning of the winter there was no purposed grounding at any junction box or elsewhere on the system, and the number of grounds had been reduced to those in junction boxes which, for the reasons above stated, could not be reached, or in tubing which could not be relaid until another year.

The average number of men employed by the underground division, including the entire staff from Superintendent down to laborers, has been 195, the highest number of employes having been 299, during the week ending June 29th.

Installation Department :—Wiring Division.

The Installation Department included during the first half of the year, in addition to the underground division, the old wiring department, which was transferred to its Superintendent on the resignation of Mr. W. B. Hadley, the former Superintendent of the wiring department. It remained in his charge until the transfer of the wiring business to the New York Electric Equipment Company, Ltd., July 1st, 1892. On the 1st of January, 1892, there were 223 jobs on the books of the wiring division (not including those transferred as practically completed to the general office books). The series of job numbers was begun afresh with the beginning of the year 1892, and

reached 2,366 within six months, making a total of 2,589 jobs handled by the wiring division within that time—involving an enormous amount of detail. It had long been the desire of the Company to separate from its main business of supplying current the ancillary business of house wiring, but it had been felt that this was not practicable or just to its employes, until arrangements could be made with some other responsible wiring contractor to take over both the labor forces and the supplies of the department, under proper guarantees, so that the men who had been in the service of the company, many of them for years, should not suffer by any change, and that the uncompleted work might be finished to the satisfaction of customers. In the early part of the year arrangements were made for the organization of a separate company, of which Mr. S. Bergman, who had lately returned from Berlin, and who had been connected with the Edison business from its earliest years, should be the head, under the title of the New York Electric Equipment Company, Limited, and satisfactory arrangements were made with that company for the transfer of the wiring business. The contract entirely divorces the wiring business from the business of this Company, just as gas-fitting is separated from the business of gas companies.

The Equipment Company is made the exclusive agent of this Company for the sale of Edison supplies, under satisfactory arrangements as to the payment of royalty to this Company, but it is especially provided that such supplies shall be sold to all wiring contractors at prices fixed by the Illuminating Company in accordance with the General Electric Company's schedules of discount, so that no undue advantage should be held by the Equipment Company as against other wiring contractors. Although this Company refers requests for estimates to the Equipment Company, it also informs customers that there are many wiring contractors in this city whose installations have met with approval by this Company; and every effort has been and will be made to give an ample and fair field for the development of independent wiring concerns in this city. On July 1st, as stated, the Equipment Company took over the wiring jobs on hand in the wiring department, except those that were so nearly completed as to be readily handled by the station forces or such as for special reasons were retained by this Company under special

contracts made directly with it. The Equipment Company has, in accordance with the contract, established its supply warehouse adjacent to the general offices of this Company, and will also have a branch office adjacent to the 26th Street station, and the arrangements with it have worked most satisfactorily throughout.

The average number of men engaged in the wiring division, excluding the Superintendent of the department, for the first six months of 1892, was 138, the highest number being 210, and the lowest 109.

During the six months the wiring division was charged with the installation of the following important isolated plants, in addition to ordinary house installations and smaller plants :

Germania Life Insurance Company, 20 Nassau St.
Western Union Telegraph Co., 195 Broadway.
Celluloid Co., 427 Broadway.
Luyties Brothers, 204 William St.
D. L. & W. Building, 26 Exchange Place.
United States Trust Co., 45–47 Wall St.
Bank of Commerce, 44 Wall St.
Hotel Waldorf, 5th Avenue and 33d St.
Hotel Renaissance, 10 West 43d St.
Consumers' Hygeia Ice Co., 420 East 53d St.
Peter Doelger, 404 East 54th St.
Hotel Marlborough, 1355 Broadway.
Bloomingdale Brothers, 994 Third Avenue.

Another condition of the transfer of the wiring business was a provision for the excellent canvassing department of the Company which had been developed under charge of the General Agent, J. E. Sayles, and this condition also was met by the Equipment Company. The services of Mr. Sayles have been retained by this Company, with those of Messrs. Hilton and Ackerman as his deputies, but the rest of the canvassing staff has been transferred to the Equipment Company, and is continuing to do good work by a general canvass, primarily for wiring installations, but ultimately, of course, for customers of this Company.

Special recognition should be made of the work of Installation Superintendent Stevenson, especially during the six months when the burdens of both divisions were upon him, and of his first assistant, Mr. T. E. Wood.

Wiring Rules.

During the year the Chief Electrician, Mr. Van Vleck, made a draft of the requirements and recommendations of this Company for house-wiring installations, which after careful consideration by the Inspection Department, and by the Staff Council of the Company, were put in print in a preliminary edition. This pamphlet has been furnished to all wiring contractors in the city, and copies have also been sent to the several Edison companies throughout the country, with the request to each to give us the benefit of any suggestion or criticism. The rules were made up after very careful consideration of the wiring rules of the insurance companies and electrical authorities in this country, and also in London and elsewhere, and are believed to be the best yet put forward. We have been favored with criticisms and suggestions from a number of wiring contractors, which will be utilized in the preparation of the final edition. Meantime the insurance authorities have been giving considerable attention to re-working their present rules, and the wiring contractors have also appointed a committee on the subject. It is intended to hold back the printing of the final edition of our own rules until the plans of the insurance authorities and of the wiring contractors have been fully shaped, so that if possible a set of rules requiring the highest standard, may be adopted by all three authorities jointly,—a result which would doubtless be most useful in setting a high standard throughout the country as well as in New York City.

The Installation Company.

With the new year the underground construction work hitherto done by the Illuminating Company directly will be handled by the Edison Light and Power Installation Company, which holds the contract with the Empire City Subway Company, Limited, for the construction of Edison ducts under the subway law. As a result, the whole work of connecting houses with the street system, including the street service, service wiring, and meter setting, will be done, to the great convenience of the customer, by one set of men, and the operating department of this Company will be correspondingly relieved. This Company has a large investment in the Installation Company's stock,

which represents a large part of the investment in the Edison underground system. The Installation Company has no bonded debt of any kind. The Installation Company holds stock in the Empire City Subway Company, Limited, and in the Manhattan and the Harlem Companies.

Inspection Department.

The Inspection Department, organized in 1891, has proved of the greatest value to the Company. During its two years of existence it has completed 5,250 inspections of house installations, of which 3,250 have been made during the present year. These have included, in addition to the inspection of the new installations of wiring contractors, as the basis for a report to the Board of Fire Underwriters and application for their inspection and certificate, an inspection of all existing house installations, old as well as new, which it is intended to make an annual feature, so that when the department is in its final shape, each installation will be inspected each year. In the course of the inspection this year a number of important installations made some years back were found to be in an imperfect condition, and the attention both of the owners and of the insurance authorities was called to the faults. As far as possible, the faults were located, and that part of the wiring which was defective was cut off from the system until the owners should make such necessary repairs as would bring the entire equipment up to the standard of this Company and of the Underwriters. This has, for the time being, caused some dissatisfaction on the part of the owners, but the real value of this work is becoming appreciated. A card system of indexing these inspections has been adopted, as the result of which it will be possible within the present year to show in a moment the condition of each installation on the system. A card system has also been organized for the record of fires, embodying the results of inspections in the case of each fire occurring in a place in which there is electric service. The first result of this has been to lessen the general practice of referring all fires of unknown origin to electric current, and in particular to relieve this Company, in several cases, from the imputation of having caused fires with which its current had absolutely nothing to do.

The Inspection Department has also developed a system of inspection of motors for a moderate fee, which returns some revenue to the Company, covering a portion only, however, of the expenses of the Department, and a similar system for the inspection of isolated plants will be developed this year.

The Inspection Department, even before this Company gave up the business of house-wiring, had the most absolute orders to treat all wiring contractors, including the wiring department of this Company, with absolute fairness and equal rigor; the best evidence of its good faith has been that each contractor has in turn complained that he was more severely treated than others, and that it is now generally admitted by wiring contractors that the department has definitely raised the standard of wiring installation in the city and has been of great service to the wiring business.

General Inspector Arthur Williams is entitled to great credit for his organization of this department.

Testing Room and Electrical Laboratory.

Within the year, in connection with the new general offices, there has been organized, under the supervision of the Chief Electrician, an electrical testing room and laboratory which serves also as a bureau of standards. This division has been of great use in testing arc-lights, incandescent lamps, motors, etc., and new appliances brought to the attention of this Company, and in standardizing and keeping in order all the electrical instruments, both portable and otherwise, owned by the Company. For this purpose the testing-room has been furnished with the best appliances that could be obtained abroad as well as in this country. It includes the most modern electrical appliances,—ampere balances and electrostatic volt meters, developed by Sir Wm. Thomson and made for us by his electrical mechanicians, the house of James White & Co., Glasgow; the British Board of Trade standard ohm, etc., as well as the latest form of photometer. A dark room is provided for the photometric and similar tests. The Company in its various departments uses nearly a hundred portable testing instruments of various kinds, of which a full record is kept in the testing-room, and which are tested regularly each week and calibrated anew from

the standards whenever necessary. The Company now possesses probably the finest working apparatus of this kind in the country.

Meter Bureau.

Much attention has been paid during the year to the meter question. Arrangements have now been made to concentrate all the meter work at the new central station, on the same floor with the general offices, under the direct supervision of Mr. Jos. H. Tyler, whose practical experience with the Edison meter is perhaps greater than that of any other person. Specific attention has been given to the comparison of the Edison chemical meter with other meters of a mechanical type, but no meter has yet been found which is as correct in its actual result as the chemical meter, based as that is on absolutely scientific principles. We have had, nevertheless, some complaint from customers as to meter charges, and it is doubtless true that the development of an accurate mechanical meter would give great satisfaction to customers in general. Meters of various types, of English as well as of American make, have been tested without finding any entirely satisfactory, while repeated tests have again and again shown the essential accuracy of the chemical meter. No human invention is, however, infalliable; and the Company has endeavored to give prompt and careful attention to every complaint, with the purpose of being exactly just in its charges. The possibility of error in the chemical meter is connected chiefly with the numerical calculations, and to make these absolutely sure, new blanks have been devised, and arrangements have been made that each step in the process shall be checked by a second observer. The chemical meter has the disadvantage that the cost of weighing twenty thousand plates per month, as is a necessity with five thousand customers, involves a very large outlay for labor, and the Company is therefore on the watch for a meter which will combine the accuracy of the chemical type with the convenience and satisfaction to customers of the mechanical type.

Department Reorganization.

In connection with the new year a considerable change will be made in the divison of the practical work among the several departments of the Company, now concentrated

under three Superintendents, the General Operating Superintendent, the Installation Superintendent, and the General Inspector, all of them having the co-operation of the Chief Electrician and Consulting Engineer as their joint adviser. The Operating Department, which is the backbone of the Company and has the highest responsibility, will be relieved of the detail of wiring from services to meters, of setting meters, etc., etc ; and all the installation work—of street construction, services to houses, service-wiring, and setting of meters,—will be in the hands of the Installation Company's Superintendent, so that one authority will be responsible for all the various processes necessary to connect new customers with the Company's system or to keep in order those portions of house-installations for which the Company is responsible. All testing, whether of house wiring installations of outside contractors, or the street construction or service connections of the Installation Company, will be tested by an authority separate from the contractors or the Installation Company—namely, the Inspection Department. By this method it is hoped to save considerable expense in labor of street testers, who must now wait the completion of mechanical work before they can make the few minutes' test required, and to obtain a more accurate knowledge of the condition of every conductor connected with the system without or within houses. An inspector for testing work will be assigned to each of several districts of moderate size. He will not only make the electrical tests incidentally required for new underground construction, but will meanwhile be carrying out the general plan of annual inspection, making insulation tests of house wiring in each house installation on a given block-face at the same time that the street system of that block-face is being disconnected from the general underground system and from the house-installations for test. In this way, with but one disconnection of houses each year, and that but for a few minutes, the annual inspection will be completed at a minimum of cost and inconvenience and a maximum result to the Company.

Insurance Question.

The history of the discussion with the insurance authorities, which was so much exaggerated in the public press, is briefly

as follows :—In the early days of the up-town system, about four years since, the practice of "grounding the neutral" was adopted after several councils on the subject had been held. Unfortunately this practice and the reason for it were not made clear to the insurance authorities, and the assumption that this was a "secret" in the practice of the company, invited misconception of the Company's motives. The rules of the Board of Fire Underwriters, regarding electrical installation, which set the standard for its Bureau of Survey, had been made (with Mr. Edison's personal co-operation and assistance) years ago, before the three-wire system had been developed, and these rules, which still apply properly to the two-wire system of high tension circuits, no longer apply, this Company contended, to the three-wire system. The rules of the Board of Electrical Control likewise antedate the three-wire system.

An erroneous impression prevailed, which it has been most difficult to eradicate, that the three-wire system dispensed with the third (neutral or middle) conductor, and saved copper by using the ground as a return circuit when the system was out of balance, thus necessitating the grounding of the neutral. This, of course, was an entire mistake, as the neutral wire of the Edison system is continuous from the station to and through all lamp installations, including both feeders and mains in the street system. The grounding of the neutral was, therefore, not an essential feature of the three-wire system, but on an underground construction so large as this Company's, particularly in a city like New York, with its constant traffic and its new pavement, it had positive advantages as a means of keeping the system in good and safe working order without too frequent repairs. The crib system of the Edison underground construction, giving to each customer the advantage of supply from several sources and in different directions, was also essentially different from the single circuits necessary on high-tension systems, and the same tests were not applicable to both.

The grounding of the neutral had several advantages, among which, in the opinion of the Company, were certain safeguards against fire, but the one disadvantage, emphasized by the insurance authorities, was the fact that it prevented as complete tests of the system as might otherwise be undertaken. It was the opinion of Mr. Edison and other authorities, that under ideal

conditions, an absolutely insulated system, even on the three-wire plan, would be preferable, but the working conditions of a large company like our own considerably modified this ideal. To overcome the essential objection to grounding the neutral, the underground division of this company had instructions early in the year to commence a series of block-face tests, which would record any unintentional grounding of the neutral, developed in connection with the general system, a test which it is intended to make each year.

Meantime the Board of Fire Underwriters had passed resolutions, requiring all companies to refrain from grounding any electrical conductor, and to report periodically the insulation of each of its circuits, under penalty of being refused certificates that wiring construction within houses was properly done. The Board was asked to postpone any decision on this subject until the conditions and practices in other cities at home and abroad could be investigated. During my European investigations I found that in Berlin, which has the next largest electric illuminating company to our own, the same practice had been followed, as was the case also in some other places in Europe; and that in London the three-wire systems there developing were looking forward to this practice as their systems grew. In Boston also the practice of grounding the neutral had been followed with the approval of the insurance authorities. On my return, this information was communicated to the Board and the records of our block-face tests were offered as evidence as to the actual condition of the system.

The Board, however, was unwilling to recede from its position, and on October 1st declined to issue further certificates—the bearing of which refusal was much exaggerated in the daily press. These certificates were to the effect that the wiring installation placed in any house by a wiring contractor was up to the standard required by the Board of Fire Underwriters. As this Company had, with the first of July, gone altogether out of the business of wiring installation, the certificate had no direct relation to the Company, but it was the practice of the Board of Fire Underwriters to require that the application for this certificate should be made by the illuminating company with whose system the installation was to be connected.

On bringing this matter before the Board of Directors of this Company, as its importance demanded, it was decided that whatever the view of this Company as to the practice of grounding the neutral, it was undesirable to continue a controversy the immediate result of which was to alarm the public and invite misapprehension as to the Company's motives and practices. It was also recognized that the high standard for house installation set by the New York Board of Fire Underwriters, which had done much to bring about the exceptionally high quality of wiring work in New York, had been so much to the benefit of this Company in its competition with less responsible and more careless companies, that any position which seemed to oppose the Board of Fire Underwriters was against public policy and the best interests of electric lighting. An arrangement was therefore made between a committee of the Board of Directors and representatives of the Board of Fire Underwriters, by which this Company undertook to conform its practice as nearly as might be to the desire of the Board of Fire Underwriters, the last-named Board giving ample time for any suggested changes to be made, and on this understanding the issue of certificates was resumed.

In connection with the underground inspection of the year, it had already been ordered that the neutral wires should be disconnected from the ground at all junction boxes except feeder-end boxes, and considerable had also been done in replacing tubes incidentally grounded with tubes in which the insulation was intact. In accordance with the agreement with the underwriters, grounds were at once removed from the feeder-end boxes, and every possible step has been taken during the balance of the year to remove other grounds. During the present year this work will be continued and completed, and the two-wire mains of the old down-town construction, which are the weakest point of the system, will be entirely replaced by three-wire mains.

It should be added, that, throughout the controversy the most courteous relations were maintained, despite statements to the contrary in the press, between the representatives of this Company and those of the Board of Fire Underwriters, and that, notwithstanding differences of opinion, there has been the most

cordial desire on both sides to promote mutually the highest standard of electrical installation. Since the settlement of the question this Company has special reason to acknowledge the courtesy of the Underwriting authorities in co-operating with it in the making of tests, as well as in the inspection of house installations. The inspection staff of the Underwriters' Board of Survey has been largely increased within the year to provide for the increasing business, and the service, which was for a time inadequate to the demands upon it, is now more efficient than ever before.

In the way of co-operation with the insurance and fire authorities the Company has also started a series of informal lectures, intended to explain to the members of the Fire Department, and to the Insurance Patrol, the relations of electricity—particularly of low tension—to danger from fire and to life. By the co-operation of Chief Bonner of the Fire Department, and Superintendent Anderson of the Underwriters' Board of Survey, a considerable representation from both interests, including assistant Chiefs and captains and lieutenants of fire companies, gathered at our general offices, and listened to practical talks and experimental demonstrations from the officers of the Company. It may fairly be said that the result was to take away much of the prejudice against and fear from electricity, particularly that of low tension, and to mark the difference between the two systems. Further talks of the same kind are to be arranged, until all the leading representatives of these interests have been fully informed on the subject.

Fires.

In connection with the insurance question special investigation was made of the fire record of the past two years in New York City, with respect to those fires attributed to electricity. The results were most satisfactory to this Company.

The records in the Fire Marshal's office of all fires attributed to electricity, in 1890 and 1891, show as follows: In addition to the fire at our Pearl street station, involving a loss estimated by the Fire Marshal at $99,350, and alarms sent from there without loss, there were reported in 1890 thirty-eight fires, involving a loss, excluding the above, of $181,151. Of these, nine were in

buildings where this Company had installations, and twenty-nine at places where this Company had none. Of these nine fires, one afterward came into court in relation to an insurance question, and the claim that the fire was caused by electricity was withdrawn by counsel after our experts had been examined; in a second case, the service of a high-tension company as well as our own was in the building, and there is a difference of opinion between the companies, naturally, as to which, if either, may have been a cause of the fire. In 1891 the total number of fires and alarms attributed to electricity was fifty-nine, involving a total estimated loss of $70,116, of which eight were in buildings where this Company had installations, and fifty-one at places where this Company had none. It is not admitted that fires "attributed to electricity" were actually caused by it; and it has not yet been practicable to analyze all these cases; but considering the fact that this Company had at the beginning of the two years probably nearly half, and at the close considerably more than half, of the total electric installation in New York, the record at its worst would seem to be very favorable to this Company. As but a portion of our system was for much of this time worked on the three-wire system with grounded neutral, it is evident that but a very small proportion of fires attributed to electricity, if any at all, had any relation whatever to the grounded neutral. It is becoming more and more evident that with good workmanship in wiring installations, electricity is the safest of illuminants, and the immediate investigation of fires by our inspection department has nearly done away with the habit of referring all mysterious fires to electricity. The card index to fires maintained during the past few months shows a remarkable absence of fires from this cause.

Relations with Employes.

The Company has been in especially satisfactory relation with its employes during the year, with the exception of two strikes forced upon its wiring division by the action of the Electrical Union. It is the especial aim of the administration of the Company not only to get the best results from its men, but

to place its men under the best possible conditions as to hours and wages.

One of the most important features of the administration of the Company is the Staff Council, including the executive and administrative officers and heads of departments, which meets at luncheon each Friday at one, and for an hour or two discusses the practical affairs of the Company, especially those in which the several departments have inter-relations. It is understood that all employes of the Company may bring any question before this council through the proper head of department. The council has otherwise been most useful in the development of engineering plans, and in deciding upon practical questions generally. An electrical library has also been started for reference purposes, which it is intended to develop into a circulating library for the use of employes generally, and notice has been given that employes may not only draw books from the library, but that books specially desired for engineering or electrical reference will be purchased for the library on suggestion. Steps have been taken also toward a Labor Benefit Fund, and at the end of the year 1892 a benefit was apportioned to each employe of the Company who had been in good standing during the year, according to his length of service, employes who had been in the service of the Company for more than five years receiving three per cent., those between five and three years two per cent., and those less than three years one per cent., on their total compensation during the year. The Company has also been wisely liberal in caring for its employes who have met with any accident in its service during the year. It is satisfactory to report that there has been no fatal accident from any cause, and no accidents whatever from electricity beyond two slight burns, during the year.

A Credit and Complaint book has been started for the new year in which complaints against any one in the employ of the Company are entered on one side, and credits for special services on the other, partly with a view of making proper discrimination in the benefits at the end of the year. The annual letter to the employes, which has become a regular feature of the administration of the Company, has promoted friendly relations throughout the working force, and has had good results.

The strikes referred to affected only the wiring division of

the Company, and were based solely on the refusal of the Company to require non-union men to join the Union. Inquiries had been made the latter part of the previous year as to the policy of this Company regarding labor organizations, and it was fully set forth in the annual letter to employes of 1891, that the Company would hold an absolutely impartial position as to such organizations, neither asking its employes to refrain from joining nor compelling them to join the Unions, and would give employment to good workmen without discrimination.

This policy was not satisfactory to the authorities of the Union, and, as a consequence, on January 27th, 1892, a strike was declared against this Company, and wiremen were called out, until, altogether, 51 of our men had left the service of the Company. It was generally understood that they went on strike only because they felt under obligations to the Union to do so, and that they not only had no grievance against the Company, but that they were sorry to interrupt their service with it. Several of the men called upon me to say this specifically. The first strike came practically to an end February 24th, without any action on the part of this Company. The great body of our employes had remained loyal to the Company, and these and any new men who had been in our employ were retained in the Company's service; the old places were given to all men, however, who returned from the strike to the service of the Company, without discrimination, provided there was work for them. When a general raise of wages was made in the spring this Company cheerfully adopted a new scale based on hourly schedule, which was, in general, more liberal to its employes than the scale adopted by the Union. A second attempt was, however, made by the walking delegate to compel the Company to require its non-Union men to join the organization, and 35 men who had been taken back into the service of the Company were called out again on, or soon after, May 16th. The Company adhered to its position, which it felt was fair both to Union and non-union men, and when its wiring business was transferred to the Equipment Company it was with an express provision in the contract that no discrimination should be made against the non-union men, but that every man who had been in the employ of this Company should have his fair chance. While it would seem that the men who had struck without grievance were not

entitled to further consideration on the part of the Company, yet it was fully recognized that the men struck under compulsion, or because of a loyalty to the Union which, however unjustifiable as against the Company, they sincerely felt. The Equipment Company adhered fully to this stipulation of the contract, and every employe of this Company had the fair chance which had been promised him.

The chief loss in the strikes, was that to the men who went out, whose wages during the time of the two strikes would have amounted to about six thousand dollars.

This Company maintained during the continuance of both strikes a force of capable workmen, adequate to fulfill all its contracts, and its only embarrassment arose from the fear of architects and contractors that their work would be stopped on buildings on which non-Union men were kept at work, under the threats of the Board of Walking Delegates. This attitude caused the Company some embarrassment, but the only actual loss of work that could be traced was on one small isolated plant installation. During the autumn an organization corresponding to that of the labor Unions was made by electrical wiring contractors to meet the threats of the Board of Walking Delegates, and to avert a threatened third strike ; and the influence of this Company, which had meanwhile given up its wiring business, was then exercised to assure fair play to Union men and to prevent any black-listing. The Company thus gave practical evidence of its desire to hold an even hand as between employer and employed, and to do justice on all sides.

It was several times stated during the continuance of this strike that there would be some kind of a boycott of this Company, or that the operating force would be called out. At one time it was stated in the press that the dynamo men had left their machines, and that during one night the officers and superintendents of the Company had "taken off their coats and run the dynamos." There was not one word of truth in these statements, and there was an absolute loyalty on the part of the operating force to the Company. In the operating department there would have been more grounds for complaint because of the practice established some years since of dividing the working day into but two shifts of twelve hours each, which kept men on duty, in work requiring constant attention, for twelve

hours at a time. The present administration of the Company recognized that this was neither just nor wise, and the Board of Directors cordially assented to a change in the labor system in the operating department, which provided for three shifts of eight hours each, in the stations which ran continuously, and based compensation upon an hourly rate, so that men working longer than eight hours should have proportionate compensation. At the same time the whole labor service of the Company, as far as practicable, was put on an hourly basis, to insure proportionate payment to men who necessarily work for different periods of the day. While the principle of paying ten hours' wages for eight hours' work could not be adopted, it was nevertheless felt by the Directors that the services of our men and the character of the work demanded of them required the best wages of the market, and, as a matter of fact, in most cases our employes continued to receive as much as before the change, and in some cases more. It is the belief of the Company that it needs the best men, and that they can only be got and kept by paying the best wages. The Company will adhere, as sound American principle, to the practice that it will not deny employment to capable workmen, whether they belong or do not belong to labor organizations, and that, on the other hand, it will not interfere with freedom of action by declining to employ Union men. It is my own especial personal desire to make the Company a model organization in all its relations with those whom it employs.

European Investigations.

During the early part of the year, after the termination of the first strike, it seemed desirable to make careful investigation as to the development of the electrical industry abroad. Accordingly I spent about seven weeks in Europe, visiting in that time Glasgow, London, Paris, Berlin, Frankfort, Heilbron, Lauffen, the Swiss works, Vienna, Buda-Pesth, Venice and Milan, with especial reference to their electrical conditions and methods. I am glad to say that I was given throughout every facility for examination and all possible information, and that the results proved the desirability of keeping thoroughly in touch with electrical progress abroad. While the business of low tension incandescent lighting had in no case abroad reached

the development at home, I found many interesting features of comparison, while in the development of artistic small electrical appliances, and even more of arc lighting, much more progress had been made in Europe than in America. The results of my investigations were given to the Directors and the staff of the Company, in an informal talk on my return, and the information has been much utilized since in the practical administration of the Company. It is proposed this year to send the General Operating Superintendent to Europe, with reference to specified details of construction and management, and I hope myself to make a yearly visit when circumstances permit.

Storage Battery.

The general use of storage batteries in connection with station work in England, France and Germany, as seen during my investigations abroad, made it seem advisable to experiment with a storage battery of a type in successful operation in England, which would not be complicated with the legal questions involved in the storage batteries hitherto known in this country. Arrangements were therefore made with the Crompton-Howell Storage Battery Co., Limited, of London, to install in a portion of our new 53d Street Station, arranged for that purpose, a storage battery of 2,000 ampere hours capacity, on which guarantees of 85 per cent. efficiency in ampere output and other guarantees were obtained. This battery is now installed at that station and will presently be working as a part of our operating system, and its results during the experimental period of six months will throw much light on a problem of very large importance to this Company as well as to other Edison low-tension direct-current systems throughout the country. After this battery has been in operation for a sufficient period to demonstrate its advantages and disadvantages on this Company's system, it is intended that the General Operating Superintendent shall give attention while abroad to the actual workings and economies of the storage batteries of the various types in use in England and on the continent. It is still an open question whether a storage battery plant, which costs in round numbers about twice as much as a generating plant of an hourly capacity equalling the total charge capacity of the battery, can be economically utilized on a system so large as that of this Company,

requiring continuous operation in at least two of its stations throughout the twenty-four hours. On the other hand, the storage battery, with the addition of a "booster," or motor dynamo for automatically raising voltage, developed by Mr. Barstow of the Brooklyn Edison Co., should be of considerable use to this Company in developing remote districts not yet ready for station equipment, if not for increasing the economy and efficiency of the dynamo plant, and will most certainly be found of use in connection with smaller Edison plants whose minimum load is so small as to permit of the use of a storage battery to replace one labor shift.

Fifth Avenue Lighting.

Early in the fall we received word from the city authorities that it was desired, in preparation for the Columbus Celebration, to take down all overhead wires from Fifth Avenue, and as the Edison Company was the only one having ducts throughout Fifth Avenue, we were asked to make provision for the city lighting on that thoroughfare. When our mains were laid on Fifth Avenue, two years since, the question of undertaking street lighting was discussed with our superintendents, but no feasible plan presented itself, as incandescent lamps were unsuitable for city lighting, and as no arc system had been developed which did not require a special wire between lamp-posts, involving either an overhead construction or a special tube underground from one post to another. It is not the habit of this Company, however, to "give up" on any problem presented to it, and the satisfactory use of arc lamps requiring only five amperes or less, in Milan and elsewhere, suggested to me that the problem could be solved by replacing the ordinary ten ampere lamps with two five ampere lamps put in pairs on a suitable lamp-post, which should contain also the necessary resistance to enable the posts to be connected with our mains by the ordinary house service. This plan was worked out with the assistance particularly of Chief Electrician Van Vleck and General Operating Superintendent Smith, and of other members of the Council, and the lamps and practical apparatus were furnished by the Equipment Co. As a result we were ready to light Fifth Avenue by the new twin-arc system the first week in October, as promised, on a method which had not been thought of a few weeks before,

and on the night before the Columbus Celebration the system was put in practical operation on the entire length of Fifth Avenue from Washington Square to Central Park. It has since been stated that a similar plan had been adopted in Hamburg, but the facts as to this statement are not at hand ; so far as is known, the system is an absolutely new development. Much is yet to be done to bring the system to its final completion and success, but the immediate results, considering the quickness with which the whole plan had to be developed and put in operation, have been much beyond what could have been expected. The Company co-operated in the Columbus Celebration by tastefully decorating the new lamp-posts, which were in themselves much more ornamental than anything heretofore seen in the streets, and also by making a flash light illumination of the Washington Arch, with focussing arc lamps furnished by the courtesy of the Electrical Construction & Supply Co.

New Work.

The work of the Company during the year 1893 will be much less onerous and costly than during the three previous years. Permits have been asked, for the extension of the underground system along Fifth Avenue to 79th Street, which, it is hoped, will be granted before the next open season, and special attention will be given to the development of our feeder system on an adequate and flexible method, so as to accomplish the results desired by the insurance authorities. The feeders have so far been laid north from the station along Broadway, so far as that street afforded capacity, and along Centre Street, to an extent required by immediate demand, but it has been planned from the beginning to look to Elm Street as the main feeder channel. The decision of the Board of Street Opening to make this an important direct and wide thoroughfare, gives opportunity for the construction of a trunk line feeder system along that street, and consultations have already been had with the city authorities in regard to this matter. The Elm Street improvement, as decided upon, deflects the street to the east at the corner of Worth Street, passing the property of this Company at its northeastern angle. That plan has the double benefit to this Company of giving its Pearl Street façade an open place at the front, and affording admirable opportunity for the construc-

tion of the proposed feeder system. Otherwise, the underground development of the year will probably be confined to installing mains in side streets, between Canal Street and 79th Street, hitherto unsupplied, according to the demands of business, unless it should be decided to extend the system to the north on the west side of Central Park. The requirements of the downtown district compel the extension of the Elm Street building to its full station height, and our architects are already preparing necessary specifications for estimates and bids. Provisions for additional machinery has already been made. The 53d Street station will also be developed in its machine capacity, but chiefly with machinery brought from downtown, and it is not considered probable that any further extension of the station building will be necessary for a year or two. In short, the Company is reaching the position where it will be able each year to utilize a larger and larger proportion of its capital now invested, and to obtain prompt and immediate return on such additional investment as it may be called upon to make from year to year.

In concluding this report of a successful year, in which unexpected results have been accomplished despite unexpected difficulties, I desire to bear witness to the hearty co-operation of the Executive and Administrative officers, as well as the labor force throughout the Company. The staff council now consists of Secretary Pryor, Treasurer Williams, Auditor Russell, Controller Shepard and General Agent Sayles, as Executive Staff; General Operating Superintendent Smith, with Station Superintendents Campbell and Tottingham, Chief Electrician Van Vleck, with Operating Electrician Donshea, Installation Superintendent Stephenson, and General Inspector Williams, as administrative staff, who may be named as those chiefly responsible with me for the conduct of the Company.

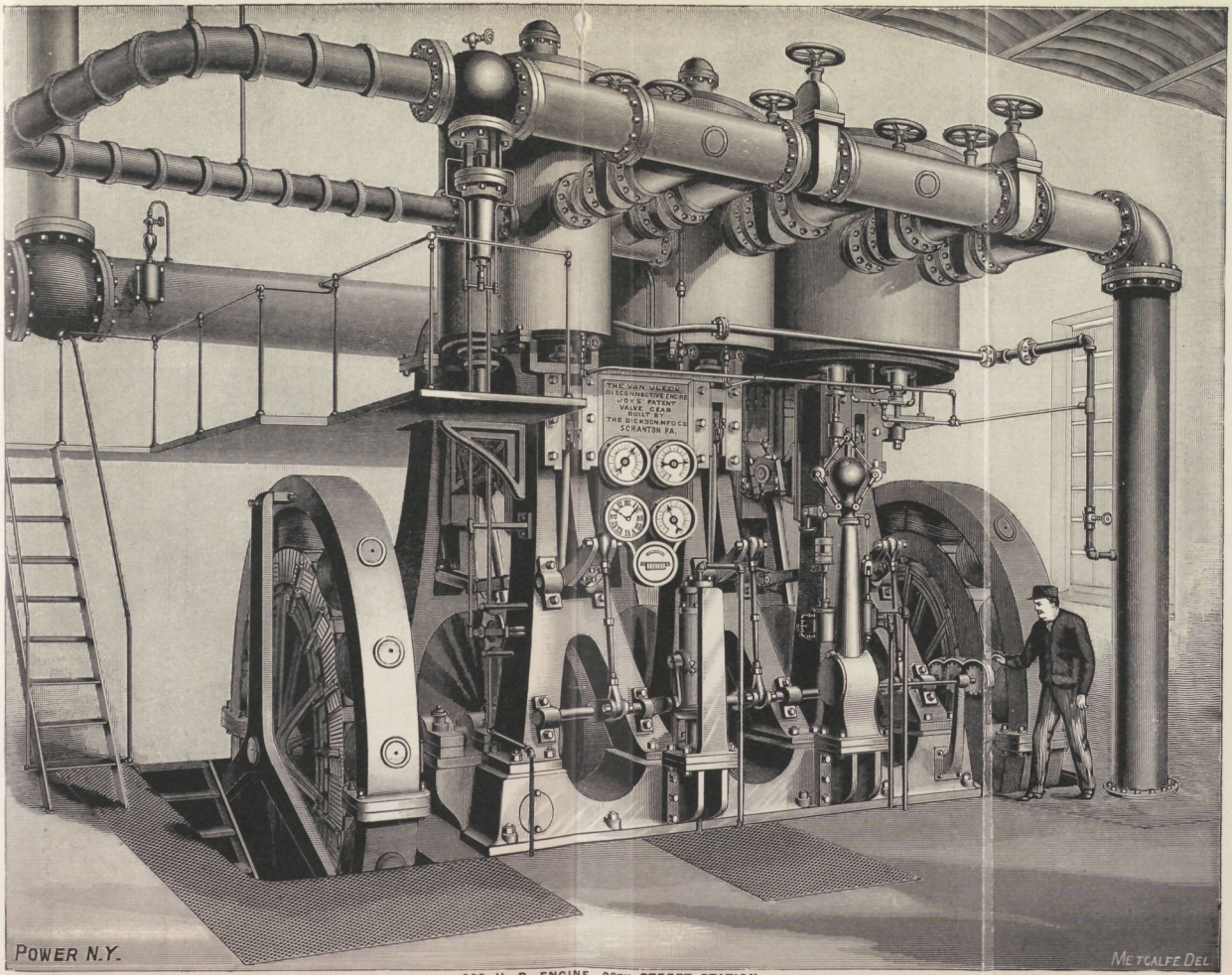
During the year the Company has with great regret lost the services of Mr. J. B. Skehan, who had long served it as Secretary and Treasurer, but who retired from it to engage in individual business. The best wishes of the Company have gone with him in his successful entrance into his new field.

(Signed) R. R. Bowker,
First Vice-President.

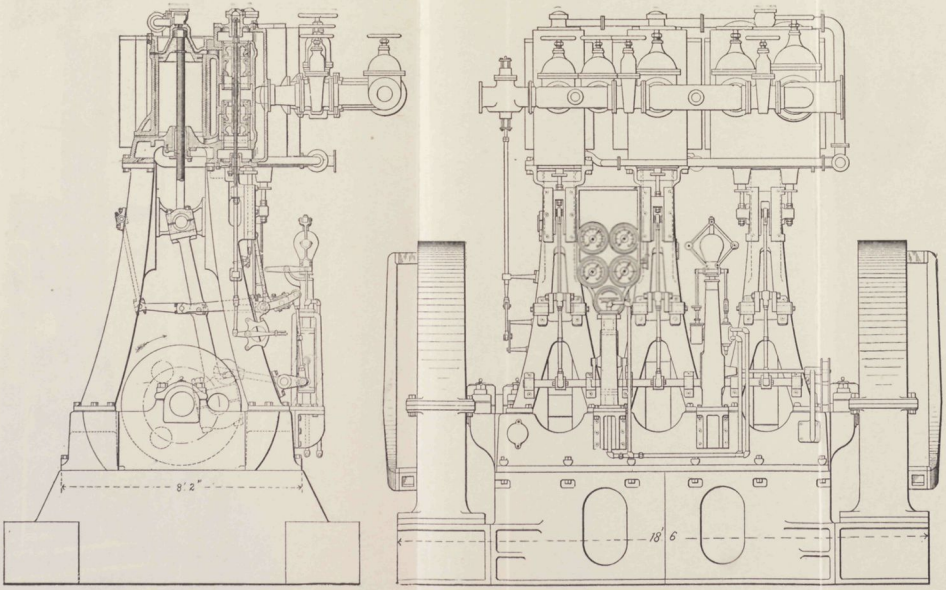
TABLE SHOWING MILES OF UNDERGROUND FEEDERS AND MAINS.

	FIRST DISTRICT.							SECOND DISTRICT.			TOTAL BOTH DISTRICTS.		
	THREE WIRE.			TWO WIRE.			Total both Systems.	THREE WIRE.			BOTH SYSTEMS.		
	Feeders.	Mains.	Total 3 Wire	Feeders.	Mains.	Total 2 Wire.		Feeders.	Mains	Total 3 Wire.	Feeders.	Mains.	Total.
Construction, 1887								16.56	19 95	36.51			
December 31st, 1887								16.56	19.95	36.51			
Added, 1888								1.37	2.84	4.21			
December 31st, 1888								17.93	22.79	40.72			
Added, 1889								3.13	8.13	11.26			
December 31st, 1889	None.	None.	None.	4.63*	10.61*	15.24*	15.24	21.06	30.92	51.98	25.69	41.53	67.22
Added, 1890	8.95	13.29	22.24				22.24	4.25	18.83	23.08	13.20	32.12	45.32
Removed, 1890				.11	1.97	2.08	2.08				.11	1.97	2.08
December 31st, 1890	8.95	13.29	22.24	4.52	8.64	13.16	35.40	25.31	49.75	75.06	38 78	71.68	110.46
Added, 1891	6.80	17.24	24.04				24.04	1.60	10.12	11.72	8.40	27.36	35.76
Removed, 1891				.22	4.13	4.35	4.35		.64	.64	.22	4.77	4.99
December 31st, 1891	15.75	30.53	46.28	4.30	4.51	8.81	55.09	26.91	59.23	86.14	46.96	94.27	141.23
Added, 1892	4.84	14.29	19.12				19.12	5.86	7.82	13.68	10.70	22.10	32.80
Removed, 1892				.03	2.41	2.44	2.44				.03	2.41	2.44
December 31st, 1892	20.59	44.82	65.41	4.27	2.10	6.37	71.78	32.77	67.04	99.81	57.63	113.96	171.59

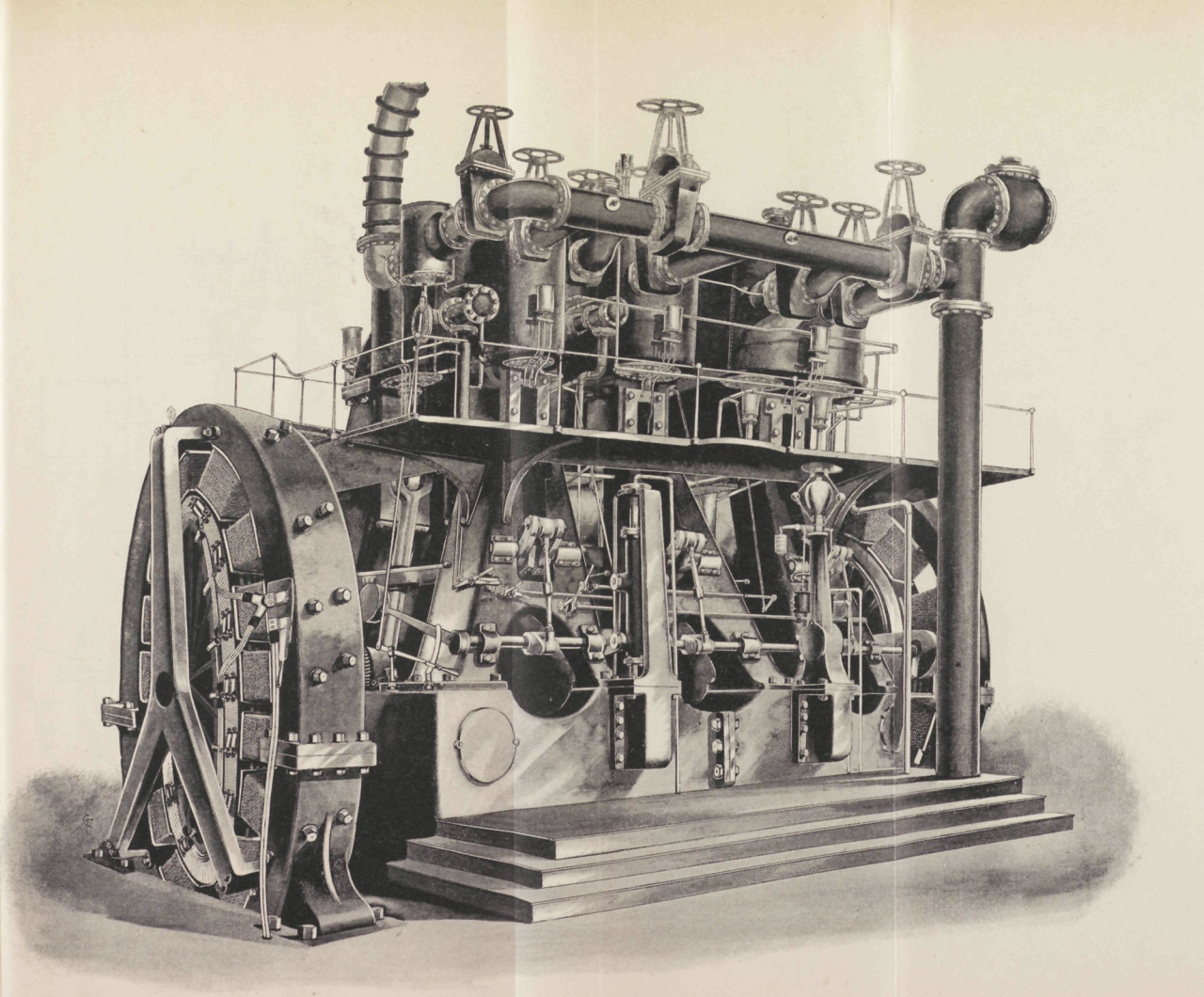
*NOTE.—Construction to this date. Previous records of the laying of two-wire tube have been lost or destroyed by fire.
NOTE.—Tube laying in the Second District began in 1887. No two-wire tube in this District.
NOTE.—Three-wire tube laying in First District began in 1890.



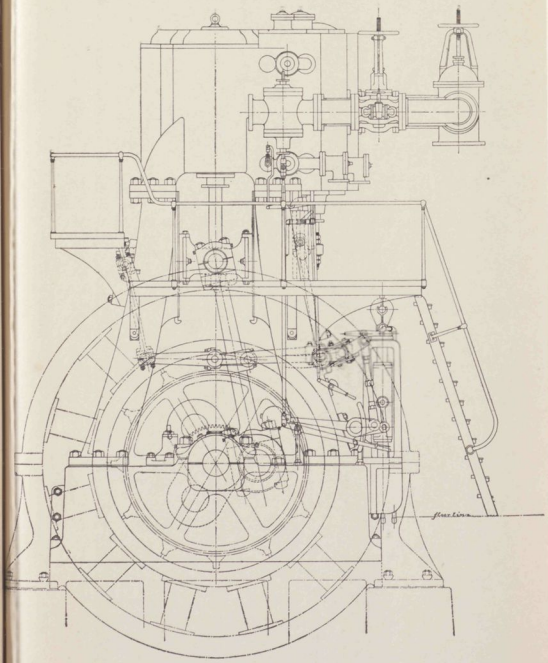
600 H. P. ENGINE, 26TH STREET STATION.

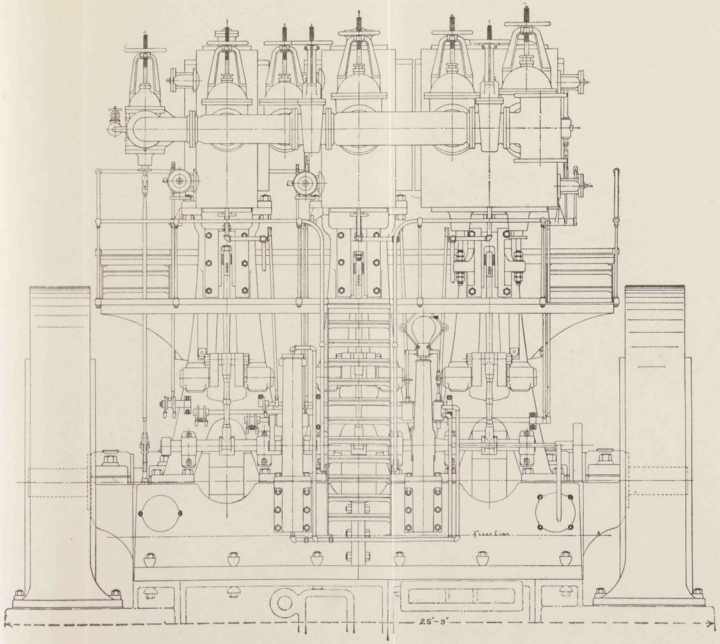


600 H. P. ENGINE, SECTIONAL PLANS.

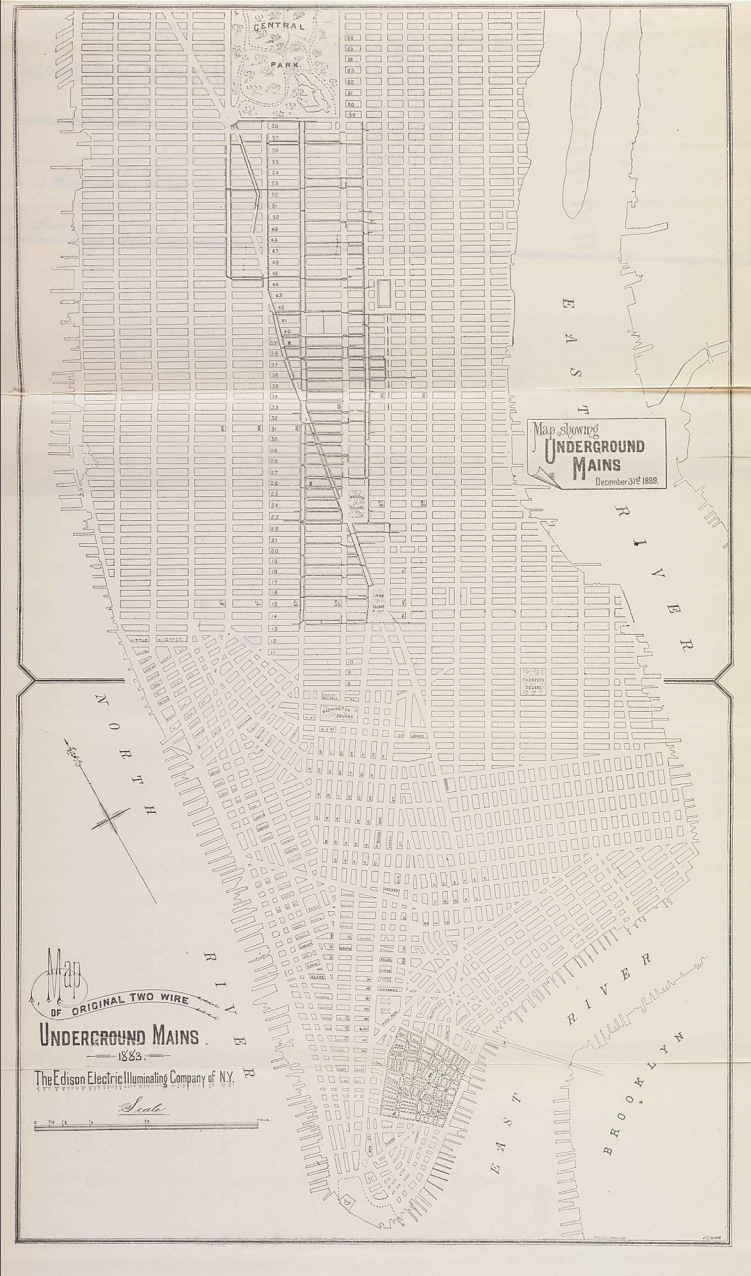


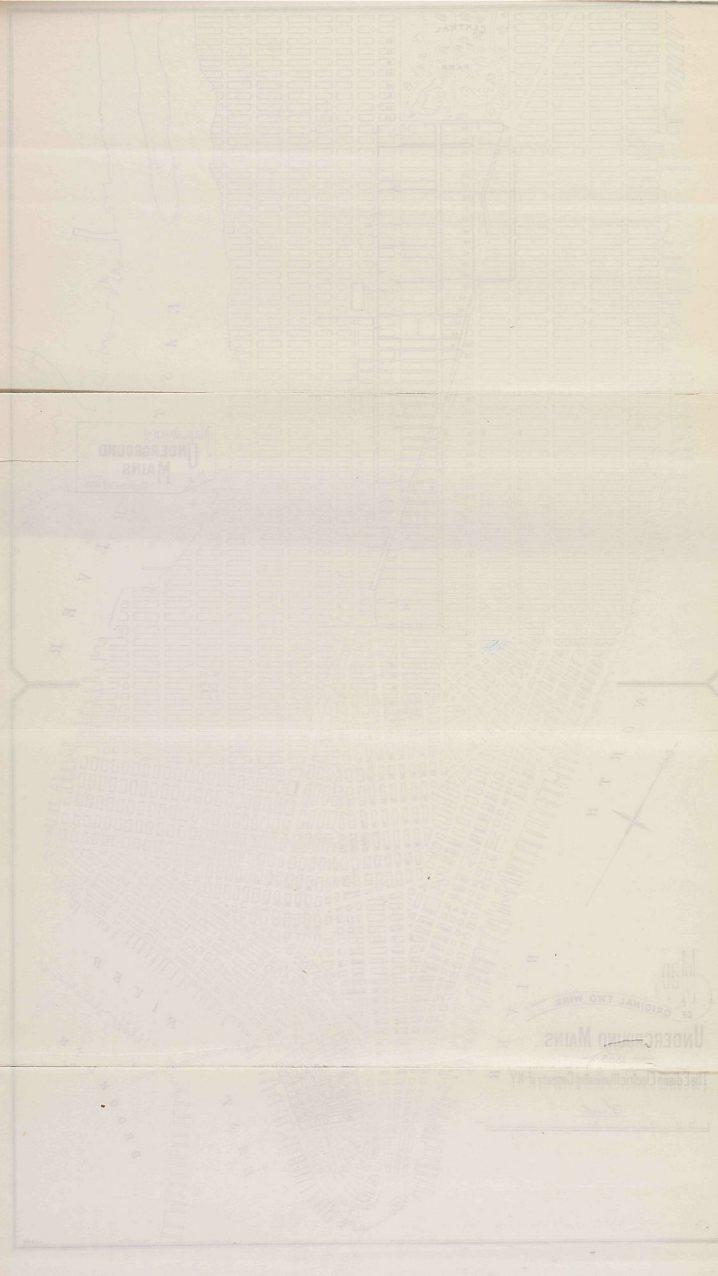
1250 H. P. ENGINE, ELM STREET STATION.

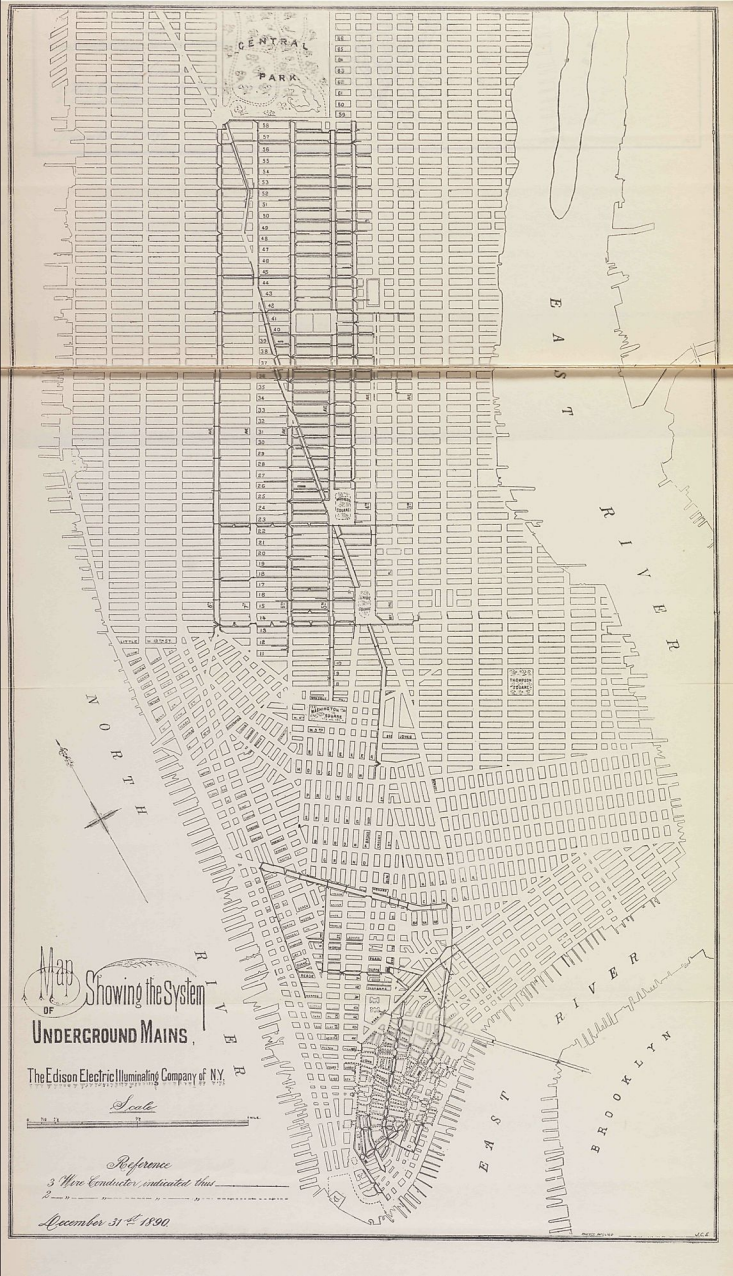


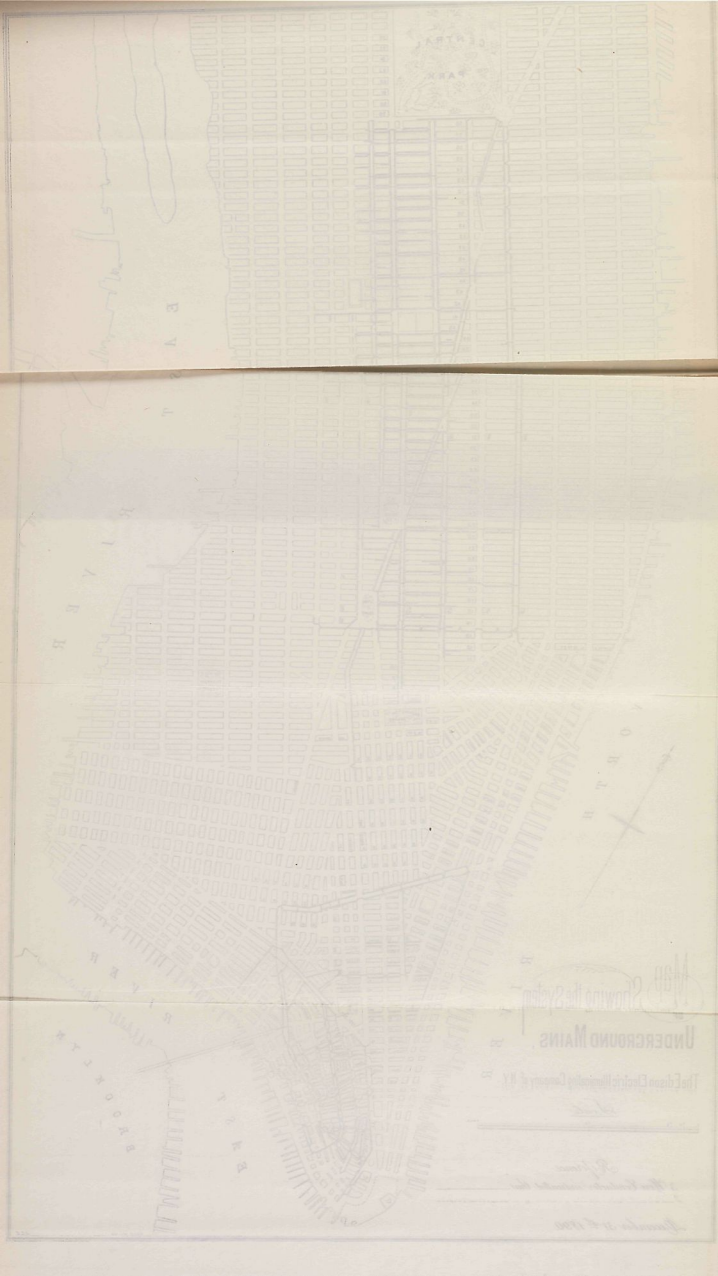


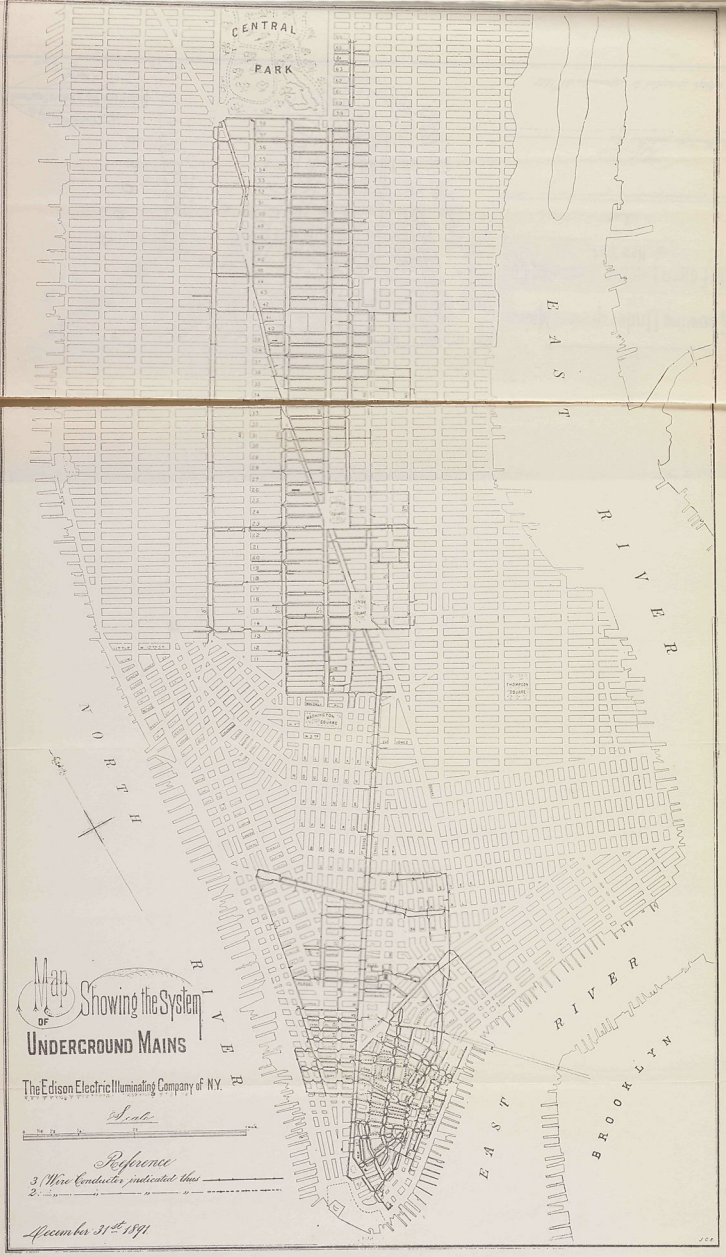
1250 H. P. ENGINE. SECTIONAL PLANS.

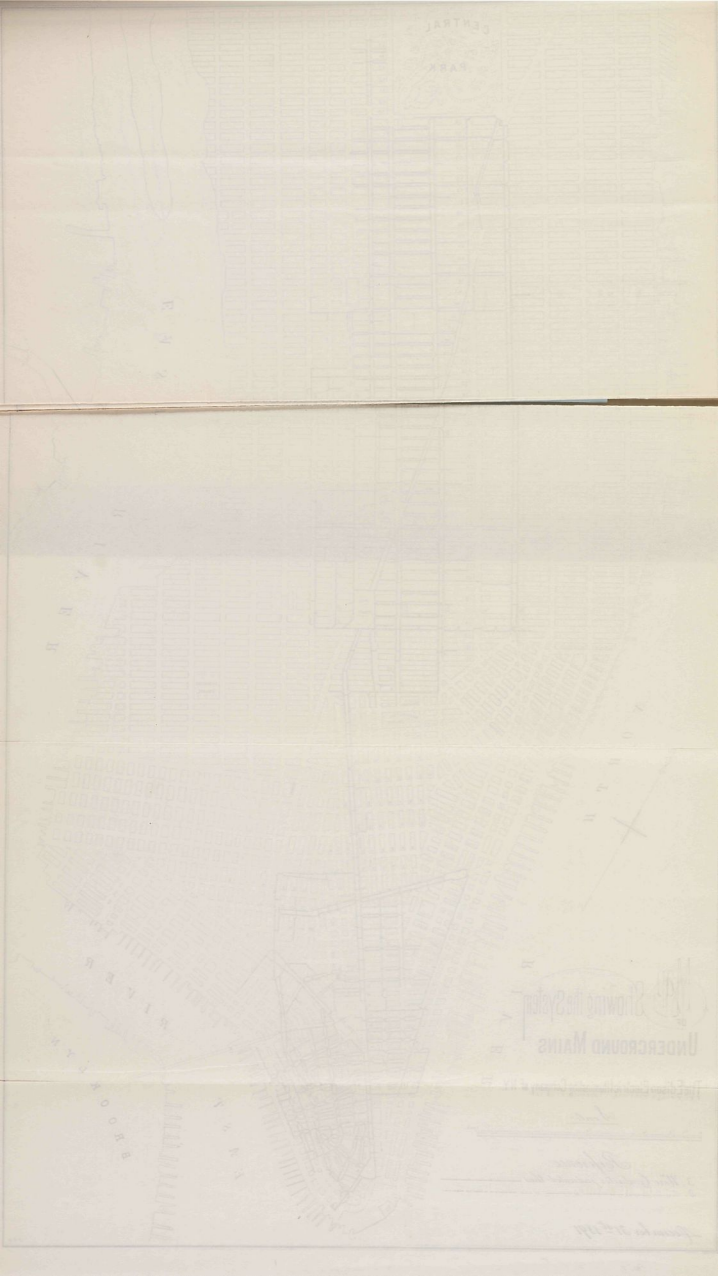

CENTRAL
PARK
EAST
RIVER
Map showing
UNDERGROUND
MAINS
December 31st 1889.
NORTH
RIVER
EAST
RIVER
BROOKLYN
Map
OF ORIGINAL TWO WIRE
UNDERGROUND MAINS.
1882.
The Edison Electric Illuminating Company of N.Y.
Scale

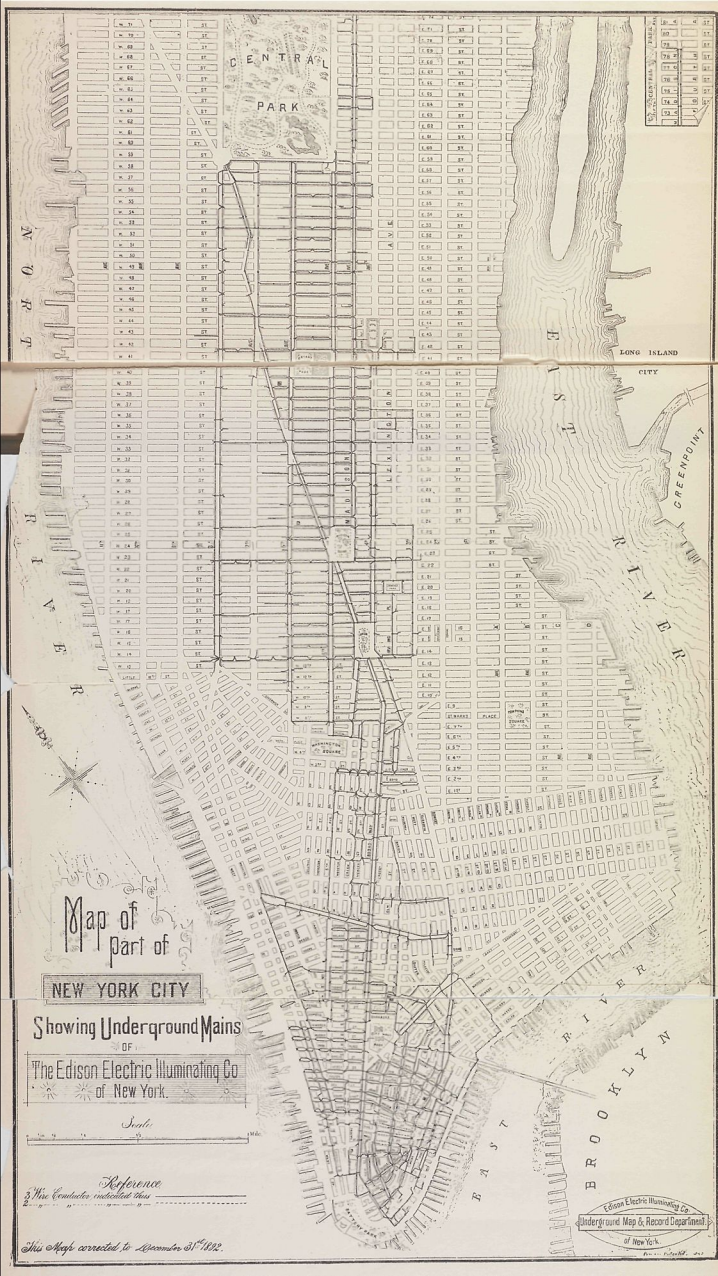


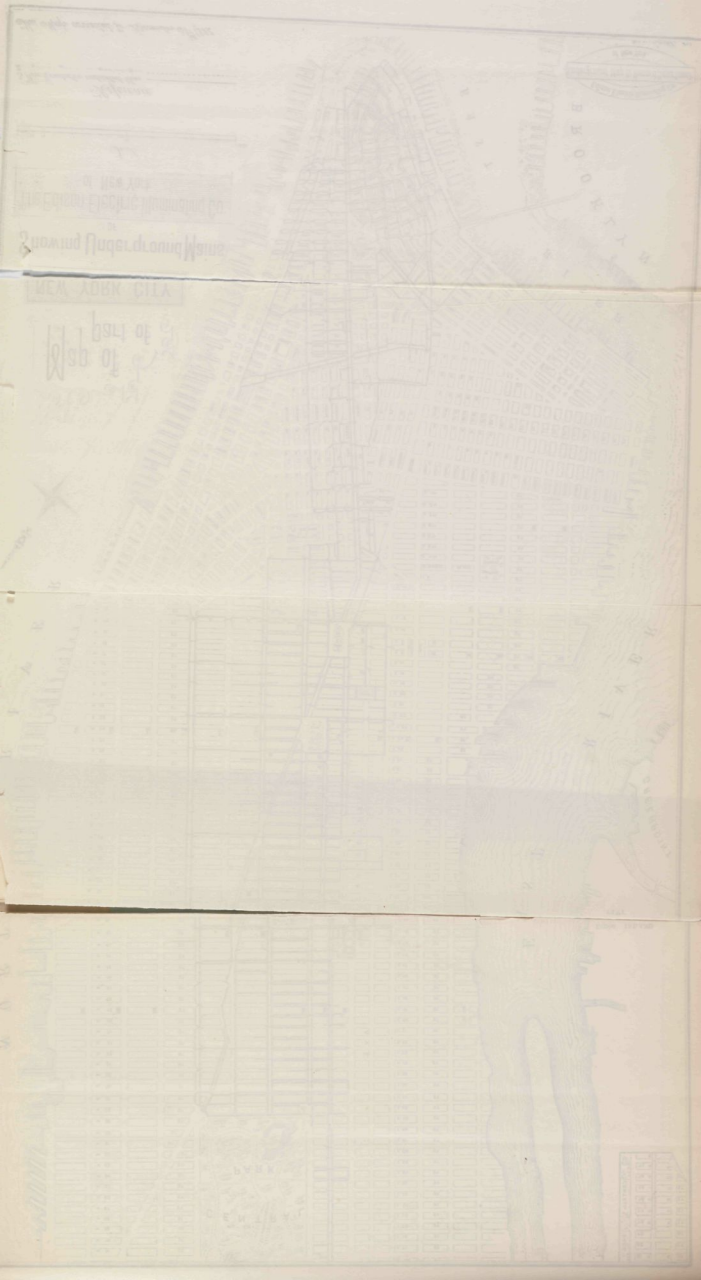

CENTRAL
PARK
EAST RIVER
NORTH RIVER
EAST RIVER
BROOKLYN
Map
OF
Showing the System
UNDERGROUND MAINS,
The Edison Electric Illuminating Company of N.Y.
Scale
Reference
3 Wire Conductor indicated thus
2 " " " " "
December 31st 1890




CENTRAL
PARK
EAST
RIVER
NORTH
RIVER
EAST
RIVER
BROOKLYN
Map
OF
Showing the System
UNDERGROUND MAINS
The Edison Electric Illuminating Company of N.Y.
Scale
Reference
3 Wire Conductor indicated thus
2 " " " "
December 31st 1891




CENTRAL
PARK
NORTH RIVER
EAST RIVER
LONG ISLAND CITY
GREENPOINT
BROOKLYN
Map of part of
NEW YORK CITY
Showing Underground Mains
OF
The Edison Electric Illuminating Co of New York.
Scale
Reference
2 Wire Conductor indicated thus
This Map is corrected to December 31st 1892.
Edison Electric Illuminating Co
Underground Map & Record Department
of New York



ANNUAL REPORT

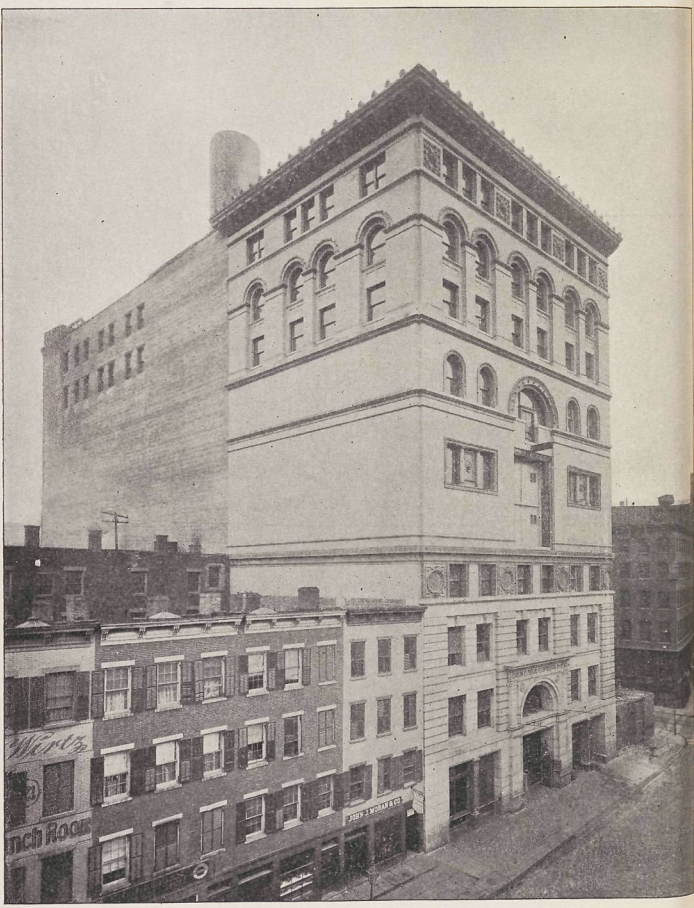
— OF THE —

BOARD OF DIRECTORS TO THE STOCKHOLDERS,

AT THEIR ANNUAL MEETING,

January 16, 1894.

The Edison Electric Illuminating Co. of New York.



VIEW OF NEW STATION (PEARL ST. FRONT)—FROM PHOTOGRAPH.

Board of Directors,

Elected January 16, 1894.

A. A. H. BOISSEVAIN,
R. R. BOWKER,
C. H. COSTER,
CHARLES E. CROWELL,
THOMAS A. EDISON,
W. E. GLYN,
E. H. JOHNSON,
D. O. MILLS,
GEO. FOSTER PEABODY,
W. A. READ,
F. S. SMITHERS,
SPENCER TRASK,
J. HOOD WRIGHT.

Officers:

SPENCER TRASK, - - - - - *President.*
R. R. BOWKER, - - - *First Vice-President.*
JAS W. PRYOR, - - - - - *Secretary.*
JOS. WILLIAMS, - - - - - - *Treasurer.*
W. A. RUSSELL, - - - - - *Auditor.*

GENERAL OFFICE.

PEARL, CORNER ELM STREET.

STATIONS:

PEARL, COR. ELM STREET,
255–257 PEARL STREET,
47–49–51 WEST 26TH STREET,
117–119 WEST 39TH STREET.
118–120–122 WEST 53RD STREET.

ANNEX STATION:

PRODUCE EXCHANGE.

NEW YORK CITY.

To the Shareholders of

THE EDISON ELECTRIC ILLUMINATING COMPANY OF NEW YORK.

The results of the operations of your Company for the year ending Dec. 31st, 1893, are:

Station earnings were	$1,193,338 91
Operating expenses, including repairs and renewal	527,311 68
Net earnings of stations	$666,027 23
Earnings from other sources	28,221 96
Income from investments	23,964 00
	$718,213 19
Less general and legal expenses and taxes	112,570 47
Net earnings of Company	$605,642 72

The returns of the business since 1890 have been:

	GROSS.	NET.
1890	$ 488,595 83	$229,076 80
1891	675,505 43	347,228 63
1892	963,021 25	475,137 61
1893	1,245,524 87	605,642 72

	1890.	1891.	1892.	1893.
Number of customers	1,698	2,875	4,344	5,154
Number of lamps, 16 c. p.	64,174	94,485	142,492	192,691
Number of motors, h. p.	697	2,000	3,807	5,529
Number of arc lights	254	841	1,637	2,538

Estimating each h. p. motor and each arc light as equal to ten 16 c. p. lamps, the present installation is equal to 273,361 lamps.

These figures show that the gross earnings have increased 27½% and the net earnings 27% over 1892; the ratio of net to gross being 48½%, or about the same as in 1892.

In view of the financial distress during the last eight months, resulting in greater ecomomies in the use of electric light, as in everything else, your Directors feel that the results of this Company's business for the year are very satisfactory, especially when it is considered that a large part of the new capital, which has been invested this year, has gone into construction which has not yet developed its earning capacity by actual operation.

A somewhat decreased use of light per customer has been more than offset by a large increase in the number of new customers; in fact, the number of applicants has been in excess of our ability to supply. This inability was partly due to the fact that last summer, during the extreme monetary stringency, your Directors felt bound to exercise great care in accepting new business, since its acceptance would have necessitated additions to our plant, which, however desirable in themselves, were not then expedient, as no funds had been provided for such purposes. Of late, the Company has resumed its policy of taking on all new applicants, thus securing a present increase of revenue, with the certainty of still further increase as soon as financial conditions shall improve. The fact that even in the extreme time of the depression through which we are passing, the demand for our light exceeded our capacity to supply it, is a forcible illustration of the soundness of our enterprise.

In the last report your Directors referred to the necessity of completing the Elm Street Station, and adding to the plant. In order to provide funds for these purposes, as well as to carry out contracts made in connection with the acquirement of a large interest in the Manhattan and Harlem Companies, also referred to in last year's report, a plan was devised last spring looking to the retirement of the then outstanding bonds of the Company by conversion into stock, which would have enabled the Company to create a new non-convertible bond at a lower rate of interest. In pursuance of this plan authority was obtained from the stockholders to increase the capital stock to provide for conversion and for the general purposes of the Company.

The financial stress which began early in the spring limited the offerings of bonds for conversion, although $688,000 bonds were exchanged. As contracts for the new work contemplated had been made early in the year, before there were any signs of the coming storm, an entire change of plan was necessitated later on, owing to the changed financial conditions. Such change was, however, satisfactorily made.

Your Directors decided that it was wise to sell some of the stock which had not been called for in exchange for bonds, and later obtained authorization from the stockholders to issue the balance of the bonds available under the mortgage ($1,750,000 in all). $1,000,000 were sold and paid for in the year just closed,

and the remainder are under option. These bonds are sufficient in amount to provide funds for the requisite construction purposes of the Company, including, as closely as can be estimated, nearly, if not quite, all the needed additions to the plant for the year now beginning.

While your Directors are convinced that the true interests of the Company require continued development, as fast as may be consistent with business prudence, yet they feel that this same prudence now demands that the additions of the present year should be somewhat more restricted than usual, and should be made only where they are likely to return the quickest revenue. In this way the existing plant will be utilized to the best advantage, and it is fully believed that the profits of the Company will be increasingly satisfactory to all concerned.

The construction of the Elm Street Station has been pushed forward, the exterior having been in the main finished. The permanent boiler room has been in use for some weeks, and the upper floors, including those intended for the offices of the Company, will be finished for occupancy during the early part of the present year.

The new 2,500 horse-power generator was installed at the close of last year, and the temporary plant in the yard next to the Elm Street Station will soon be discontinued, and put to other uses.

For a part of 1893, the old Pearl Street Station was not in use, but during the heavy load of this winter it has been used to supplement the Elm Street Station. It is hoped, however, that we shall be able to discontinue it entirely during the year now begun. These changes will permit the concentration of all of the Company's generating apparatus down-town in the one large station, with the exception of the small subsidiary plant at the Produce Exchange Annex, thus completing another and most important step toward an increased economy in operation.

The equipment of the 26th Street Station has been completed to its full capacity during the year, and the generating apparatus at the 39th Street Station has been increased.

The underground extensions of the year have been confined chiefly to Fifth Avenue, from 60th to 79th Streets, and the adjacent blocks to the east, resulting in a large increase of installation in that important residential quarter; to the development of feeders and mains where elsewhere necessary to supply

new business, and to establishing the system in streets included in the new paving plans of the city authorities.

The policy of your Directors in discontinuing the business of installation work inside of buildings, as referred to in the last report, has been thoroughly justified by the events of the year, over 100 different contractors having made satisfactory installations in connection with our system. It is gratifying to note that half of this work has been done by the New York Electric Equipment Company, to which the old Wiring Department of this Company had been transferred. Your Company has, however, been most careful to hold an even hand among the several contractors, so that it should not be accused of giving one an advantage over another.

The careful oversight given to the affairs of the Manhattan Electric Light Company, Limited, and The Harlem Lighting Company, in which this Company became interested, as stated in our last report, has resulted in a satisfactory development, those corporations both having shown an increase of earnings during the year, sufficient to justify the expectation of the ultimate payment of satisfactory dividends. The actual and contingent obligations existing in connection with the Manhattan and Harlem purchase, are now reduced to about $400,000, maturing at various dates from the spring of 1894 to the winter of 1894–1895. It will also be desirable to make a moderate expenditure during the year in enlarging the Manhattan plant. To meet all these outlays, your Company holds about $600,000 of the Manhattan Company's first mortgage bonds, which it will, perhaps, be expedient to guarantee and dispose of, from time to time, as opportunity shall offer. A special meeting of the stockholders will probably be called later on to consider this matter.

The Courts have confirmed the Edison lamp patents by numerous decisions during the year, as a result of which, arrangements have been made to collect considerable sums for the past use of infringing lamps, as well as to provide for the payment in the future of royalties for the use of the Edison lamp.

By order of the Board of Directors,

SPENCER TRASK,
President.

New York, January 11th, 1894.

THE EDISON ELECTRIC ILLUMINATING COMPANY

OF NEW YORK.

DR. INCOME ACCOUNT YEAR ENDING DECEMBER 31ST, 1893. CR.

Dividends paid, 1893:			
May 1	$97,458 00		
August 1	115,624 50		
November 1	119,046 00		
Due February 1, 1894	119,046 00		
		$451,174 50	
Bad accounts written off		14,484 25	
Interest on Bonds		144,820 83	
Balance		42,793 40	
		$653,272 98	
Balance, December 31, 1892	$51,291 15		
Less 1892 accounts written off	3,660 89		
			$ 47,630 26
Net Earnings, 1893			605,642 72
			$653,272 98

E. & O. E.

NEW YORK, December 31st, 1893.

JOS. WILLIAMS,
Treasurer.

THE EDISON ELECTRIC ILLUMINATING COMPANY

OF NEW YORK.

DR. CONDENSED BALANCE SHEET, DECEMBER 31, 1893. CR.

License under Edison Patents			$3,020,000 00		
Real Estate, Construction and Property, and other Investment Accounts		$7,335,682 49			
11,164 Shares Edison Light & Power Installation Co.		1,116,400 00			
683 Shares New York Electric Equipment Co.		68,300 00			
			8,520,382 69		
Customer's Accounts			156,296 10		
Sundry Accounts and Supplies on hand			70,133 03		
Cash on hand			189,750 89		
			$11,956,562 71		

Capital Stock		$10,000,000	
Less Treasury Stock	2,062,000	$7,938,000 00	
First Mortge. Convertible Gold Bonds	4,312,000		
Less Treasury Bonds	750,000	3,562,000 00	
Bills and Accounts Payable		157,328 60	
Sundry Accounts		8,359 04	
Dividend, No. 35 (due Feb. 1, '94)		119,046 00	
Accrued Interest		59,366 68	
Reserve Fund		69,668 99	
Profit and Loss		42,793 40	
		$11,956,562 71	

E. & O. E.

NEW YORK. December 31st, 1893

JOS. WILLIAMS,
Treasurer.

First Vice-President's Report.

New York, 10th January, 1894.

Spencer Trask, Esq., President.

THE EDISON ELECTRIC ILLUMINATING COMPANY OF NEW YORK.

Sir:

The year 1893, with its extreme and long-continued business depression, has made a severe test of the stability of this Company's prosperity. The results of that test are most assuring and satisfactory. The enforced economies in the use of light in shops and residences, the dullness in trades using electric motors in their factories, the exceptional freedom of the fall and winter from dark weather—all these on the one hand have tended to curtail the use of electric current, and, consequently, to decrease gross revenue. On the other hand, the unusual strain of the previous winter's load upon inadequate station machinery and street conductors made repair and renewal expenses in 1893 abnormally large; the new Elm Street Station was not fully equipped to concentrate the down-town business; and the upper Fifth Avenue district was not developed, to give the new Fifty-third Street Station adequate load, until the last of the year—all of which tended to a relative increase in operating expenses. Much of the new capital which it was necessary to invest in 1893, had not become actively productive. It is the more remarkable, therefore, that in face of the hard times, the Company has been able to pay an increased dividend for the entire year. Such a combination of adverse circumstances is unlikely to repeat itself, and, as in normal years operating expenses should decrease proportionately as gross revenue increases, the Company faces 1894 with every assurance of large prosperity.

As stated above, the tendency of the times has been to curtail the use of light per customer. On the other hand, the Company, in spite of the hard times, has been able largely to increase the

number of its customers, and the remarkable result of 1893 is due largely to this fact. It was estimated at the beginning of the year that the installations should reach at its close the equivalent of 250,000 16 c. p. lamps; they have actually outreached 270,000, and this increase has practically offset the reduction of revenue from older installations.

Between December 31, 1892, and December 31, 1893, the number of customers of the Company has increased 18 per cent. (4,344 to 5,154), the installation of incandescent lamps 35 per cent (142,492 to 192,691), of arc lights 55 per cent. (1,637 to 2,538), and of motors 45 per cent. (3,807 h. p. to 5,529 h. p.), the total installation, including arc lights and motors, reckoned at an average of ten 16 c. p. to an arc lamp or to a motor, 38 per cent. (the equivalent of 196,932 16 c. p. lamps to the equivalent of 273,361 16 c. p. lamps). The actual increase is greater both in lights and in motors than that of any preceding year, although the percentages necessarily decrease with the increase of the basis of proportion each year. The following table shows the net increase in the several classes of installation for the past three years :

	Dec. 31, 1890.	Dec. 31, 1891.	Increase, 1891.	Dec. 31, 1892.	Increase 1892.	Dec. 31, 1893.	Increase, 1893.
Customers.....	1,698	2,875	1,177	4,344	1,469	5,154	810
Inc. Lamps.. ...	64,174	94,485	30,311	142,492	48,007	192,691	50,199
Arc Lights.....	254	841	587	1,637	796	2,538	901
Motors h. p.....	697	2,000	1,303	3,807	1,807	5,529	1,722
Tot. 16 c. p. eq..	73,684	122 895	49,211	196,932	74,037	273,361	76,429

The number of customers, as well as of installations, would have increased still more but for the fact that during a part of the year the demands upon the system were so much beyond the immediate sources of supply that the Company was obliged to limit itself from taking on all the business in sight. Contracts have been made for the supply, early in 1894, of the equivalent approximately of 20,000 16 c. p. lamps additional.

The following table shows the returns of each district (I., down-town; II., up-town) for each month on current supplied to these installations, not including the Company's other sources of income or its general expenses :

	FIRST DISTRICT.			SECOND DISTRICT.		
	Gross Earnings.	Expenses.	Net Earnings.	Gross Earnings.	Expenses.	Net Earnings.
Jan ...	$53,583.02	$20,495.04	$33,087.98	$65,177.52	$23,701.91	$41,475.61
Feb...	51,544.46	19,415.13	32,129.33	52,881.82	19,816.52	33,065.30
Mar ..	49,327.65	24,158.61	25,169.04	51,445.39	25,085.84	26,359 55
April .	49,902.78	20,014.39	29,888.39	49,755.07	23,751.24	26,003.83
May ..	44,918.89	20,641.12	24,277.77	45,897.28	26,457.81	19,439.47
June...	43,542.37	18,195.19	25,347.18	39,692 21	24,973.11	14,719.10
July...	45,910.59	17,815.94	28,094.65	34,069.56	21,418.54	12,651.02
Aug...	40,885.34	19,759 38	21,125.96	31,720.66	20,821.64	10,899.02
Sept ..	45,101.45	16,422.78	28,678.67	40,160.38	19,214 81	20,945.57
Oct ...	52,543 94	17,955.21	34,588.73	51,378.54	22,455.30	28,923.24
Nov ..	57,466.49	20,080.41	37,386.08	62,836.32	27,354.65	35,481.67
Dec..	60,007.52	22,844.16	37,163.36	73,589.66	34,462.95	39,126.71
	$594,734.50	$237,797.36	$356,937.14	$598,604.41	$289,514.32	$309,090.09

While the gross returns from the two districts are curiously coincident in amount, the conditions are very different, and the results in operating expenses and in net returns vary accordingly. The down-town district had, December 31, 1893, 3,350 customers, using 66,288 incandescent lamps, 985 arc lamps and 3,787 h. p. in motors, supplied through 78 miles of mains and feeders. Its business, although now extending into the new district between Canal and Eighth Streets, still closely represents that second stage of electric lighting companies, when the most important section of a city is supplied from one station, through a compact street system, at large comparative profit,—the condition of the old Pearl Street station with its 15 miles of two-wire conductors in the early days of the Company. Its incandescent lighting is largely for offices using light through day hours, and this and its supply of power for motors give a day-load of remarkable average, comparatively steady from day to day and from season to season. The up-town district had, December 31, 1893, 1,804 customers using 126,403 incandescent lamps, 1,553 arc lamps and 1,742 h. p. in motors, supplied through 109½ miles of mains and feeders. Its business, though much of it is concentrated in the neighborhood of the 26th Street station, distinctively represents the third stage, that of further extension into less compact territory; the installations large in proportion to the consumption of current, are

chiefly in residences, shops, clubs and theatres, requiring costly investment in generating machinery for a use chiefly during the few hours after dusk, and varying in an extraordinary degree from summer to winter. This district requires a development of the street system in advance of present need, and supplies a section of the City 3½ miles long, from three stations, two of them still with inadequate load. It is in this district that the economies of consumption in 1893 have been chiefly felt, and, consequently, that the ratio of operating expenses has been unduly large. It is probable that the down-town district will always show large average results, while the up-town district will show low returns, especially in net earnings, in summer, and very high returns in the winter months. The increase of small manufacturing business up-town, and the development of electric lighting in the upper part of the City, will, however, tend to make the returns from the up-town district relatively better each year. It is also to be noted that the doctrine of averages holds more closely in the up-town district, so that investment in generating machinery is not required to the same percentage of the total installation. The accounts of the two districts, so far as returns from customers and operating expenses are concerned, are kept quite separately, and they afford a very useful means of comparison in the administration of the Company.

Stations and Equipment.

Work on the new station, extending from Duane to Pearl Street, next to Elm Street, was resumed early in the year, and the Duane Street front of the lower portion was completed in the spring. The building has been erected to its full height during the year, and its exterior portion completed with the exception of a few minor details ; but the financial depression of the summer caused the limitation of the interior work to that necessary for the immediate requirements of the station. The upper floors, including the space intended for office purposes, will be put in shape during the spring, but it is not intended to make expenditures beyond those immediately necessary for the proper handling of the Company's present business. The upper portion, however, was utilized during the latter part of the year, both for permanent boilers and for coal storage, and the arrangements now in progress will permit the concentration of all the

boiler power in the permanent boiler room, and the disuse of the engines and dynamos in the yard annex. This will result in economies of operation which it was not possible to put into force in 1893. As the plans of the Elm Street building were described at length in the last annual report, further description is deferred until the new equipment shall have been in full working order for several months, but a view of the building, from a photograph, is included with this report. It will be seen that there has been some modification of the architects' plans as shown in last year's report, and that the building has been carried to a height giving space for the general offices and several departments at the top.

Five of the new double-decked Babcock & Wilcox boilers, adapted for 200 pounds working pressure of steam, are in use in the boiler room, and the new 2,500 horse power Van Vleck disconnective engine, of the quadruple expansion type, with two 800 kilowatt dynamos, is installed in the engine room. A view of this engine and sectional drawings are appended to this report.

The increasing number of installations on our system again made it impracticable to dismantle the old Pearl Street Station, but that station was used for some weeks as a reserve only, and it was not until the heavy load of the winter that its operation was resumed. It is hoped that this station will be put out of service permanently early in the year, and the final economy planned for the down-town district consummated by concentrating all the generating operations, except for the small quantity of current generated at the Produce Exchange annex, within the new station, which is now capable of producing over 30,000 amperes per hour. The results of the year, in the down-town district, have already justified the policy of the Company in concentrating operations in one large station, notwithstanding that the full economies have not yet been shown.

The machinery of the Produce Exchange annex has been removed from its former position to its final position, under the court yard between the new and the old buildings. It has now a capacity of 2,400 amperes.

The 26th Street Station has been equipped with its full complement of machinery within the year, and has now a rated capacity of, approximately, 20,000 amperes. Improvements have been made in the electrical fittings and in the stacks.

The 39th Street Station has been further equipped with new boilers, completing one side of the boiler room, and a fifth electrical unit has been added during the year; improvements have also been made in the stacks. This station, with a rated capacity of 6,500 amperes, has been run as a one-watch annex, supplementary to 26th Street Station, and besides supplyiug the Metropolitan Opera House and other large installations in the neighborhood, has been a valuable help to the lower station, during the maximum hours, by means of tie-feeders, built during the year, between these stations.

The 53d Street Station has had additional boiler equipment during the year, and, with its storage battery, giving it now a capacity of 4,500 amperes, has been adequate to supply the demand from the upper part of the City. This demand, however, with the development of the new Fifth Avenue district, is increasing rapidly, and, when the old Pearl Street Station is discontinued, part of its equipment will be moved to the 53d Street Station.

Operating Department.

The down-town district, including the new Elm Street Station, the old Pearl Street Station and the Produce Exchange annex, reached during the year a maximum load of 24,400 amperes, December 14th, the equivalent of over 53,000 lamps burning at one time. The best average of the year was 8,829 amperes, December 15th. The maximum output of this district in 1892 was 21,000 amperes; in 1891, 13,550 amperes, and in 1890, 8,340 amperes. Its best daily average in 1892 was 7,906 amperes; in 1891, 5,200 amperes, and in 1890, 3,382 amperes.

The up-town district, including the 26th Street Station, the 39th and 53rd Street Stations run as annexes, and the 58th Street annex, until its final discontinuance April 14th, reached, during the year a maximum load of 27,330 amperes, December 15th, the equivalent of 59,000 16 c. p. lamps. The best daily average of the year was 10,673 amperes, December 16th. The maximum output of this district in 1892, was 20,320 amperes; in 1891, 15,100 amperes, and in 1890, 9,045 amperes. Its best daily average was in 1892, 7,473 amperes; in 1891, 7,300 amperes, and in 1890, 3,142 amperes. The increase of high daily

averages in this district during the winter has been a very satisfactory development.

At the individual stations the maximum load of the year was reached at the new Elm Street Station, December 12th and 13th, with 19,300 amperes ; at the old Pearl Street Station, January 9th, with 6,300 amperes, and at the Produce Exehange annex, January 5th, with 2,800 amperes—both these stations having been relieved during the latter part of the year by the increased capacity of the new station ; at the 26th Street Station, December 13th, with 19,100 amperes ; at the 39th Street Station, November 27th, with 7,400 amperes, and at the 53rd Street Station, November 11th, with 3,080 amperes.

The highest load of the entire system taken together was on December 15th, a maximum of 51,480. The best average of the system was on December 22d, 18,955 amperes.

The total ampereage of the year was, in the down-town district, 47,317,512 ampere hours, and in the up-town district, 43,812,810 ; in both districts a total of 91,130,322 ampere hours.

It is expected that by removing the machinery of the old Pearl Street Station to the up-town annexes during the year, provision can be made for carrying the business of the winter of 1894–5, without additional expenditure for new generating equipment—although it may prove desirable later in the year to make some provision for further reserve.

Underground Installation.

The mileage of the underground street system December 31, 1892, was, on the 3-wire system, 53.36 miles of feeders, and 111.86 miles of mains, a total of 165.22 miles on the 3-wire system ; and 4.17 miles of feeders, and 2.39 miles of mains, a total of 6.57 miles* of the 2-wire system. The total mileage of last year, including .69 miles of cable feeders contiguous to the stations, was 172.48 miles of mains and feeders. The system also included 1,008 junction boxes at intersections.

During the year 1893, in the down-town district, 6.3576 miles of 3-wire feeders have been laid, and .1830 removed, an increase of 3.1746; and 6.3397 miles of mains have been laid, and .2337 miles removed, making an increase of 6.1060 miles. Of the old 2-wire

* A correction of .20 mile in figures previously reported.

feeders in the down-town district 1.8340 miles have been removed, and but .1865 miles laid (to make certain connections), making a decrease of 1.6475 miles; and 1.6506 miles of mains have been removed and none laid. This leaves but 2.5322 miles of feeders and .7443 miles of mains of the old 2-wire system, in all 3.2765 miles of 2-wire conductors. The entire system of 2-wire mains would have been removed during the year, but for the fact that the part remaining was under new paving which the city authorities were unwilling to have disturbed.

In the up-town district 5.9718 miles of feeders have been laid, and 1.0845 removed, and 5.6760 miles of mains laid and 1.6026 removed, making an increase in feeders of 4.8873 miles, and in mains of 4.0734 miles, a total increase of 8.9607 miles, all 3-wire, in the second district.

The total increase of the system, in both districts, is 14.9432 miles, bringing the grand total to 187.42 miles. The increase in junction boxes has been 77, making a total of 1,085.

The changes of tubing in the up-town district have been because of the necessity of increasing the distributing capacity of the system in parts of the city where the demand was very large and where a small size of tubing had been laid when the up-town system was first planned. These changes have been made mostly where the new paving plans required immediate action.

The number of service connections placed during the year was 570 in the down-town district, and 460 in the up-town district, in both, 1,030 services.

The underground work of the year has been devoted chiefly to filling in the general system in those parts of the city where business specially developed, or in streets where new paving was to be done by the city. The most notable work has been the completion of the system on Fifth Avenue, from 60th Street to 79th Street, and on many of the streets contiguous on the east; the extension of feeder lines from 53rd Street station along Sixth Avenue to connect with that region, and the completion of tie feeders between 26th and 39th Street stations.

It is intended to restrict underground work for the coming year to such development of the street system as may be necessary to meet the demands of business and to place underground tubing in important streets which are to be newly paved.

Inspection Department.

The Inspection Department now includes the relations with customers as to contracts and complaints which were formerly in charge of the General Agent's Department, which was discontinued in the fall of 1893. That economy and concentration became possible through the development of electric construction firms since the abolition of the Wiring Department of this Company, and the influence of their competition in extending the business of this Company without direct canvass on its part. During the year not less than 135 construction firms or wiremen have reported installations, most of which were found to be up to the requirements of the Company, or have been brought, through the efforts of the Inspection Department, up to the high standard now enforced by the Company and by the insurance authorities. While the great body of these installations have been made by thirty-six wiring contractors, the figures illustrate the development of the business of electrical installation since this Company abolished its Wiring Department, and confirm the wisdom of that course. Of the total installations, about half have been made by the New York Electric Equipment Company, which succeeded to the work of this Company's Wiring Department, their work including the electrical installation of the Metropolitan Opera House; the Tucker Electric Construction Company holds the second place, their installations including the new residence of Mr. Cornelius Vanderbilt—the largest private equipment on our system; H. Ward Leonard & Co., Charles L. Eidlitz, Randolph & Sullinger and the Conduit Wiring Co., coming successively in order among the largest contractors. In the equipments for the year are included installations for cooking apparatus, phonographs, storage batteries, depositing baths, etc., besides motors from at least thirty different manufacturers. The Inspection Department has, throughout, been most careful to treat all contractors and all types of apparatus—outside of those infringing Edison patents—absolutely without favoritism, and without discrimination except as to the quality of work.

During the year the Department has pursued the plan of block-face inspection throughout the city from 79th Street at the north, to Barclay and Beekman Streets at the south. As soon as the

season permits, this inspection will be completed in the lower part of the city, beginning at the Battery and going north, so that within little more than a calendar year every street main and house installation on the system will have been tested, and its present insulation registered at this office. The block-face system involves disconnecting each main for a short period from the general system, and testing simultaneously the street conductors and the house installions connected therewith. Such tests have been made on 1,721 block-faces, and with few exceptions, the insulation both of street conductors and house installations, has been found satisfactorily high. Where street mains tested below requirements, the attention of the Installation Superintendent has been immediately given to increasing insulation, and where house installations were below the standard, the attention both of the householder and the insurance authorities was called to the necessity of bettering the equipment, with results that have been gratifying both to ourselves and to the insurance authorities. A method of testing the system from the stations without turning off current has been under trial, and it is probable that it will be developed to successful application throughout the system during the coming year. A monthly inspection of all feeders was also made during most of the year ; an inspection of isolated plants was partly carried through, and the system of weekly inspection of motors, for a small fee, has proved more than self-supporting.

The Inspection Department has also developed the system of investigating and recording fires which was started in 1892. The latest published report of the Fire Marshal, that for 1892, attributes to electricity, in the City of New York, in all, 68 fires, involving a total loss of only $32,271, an average of $474. The work of our Inspection Department in investigating fires, in co-operation with the Fire Marshal and the insurance authorities, is greatly lessening the habit of attributing to electricity most fires of unknown origin, and it is becoming more and more evident that, particularly in a city like New York, where the insurance requirements are high and are rigidly enforced, electricity is, on the whole, a safeguard against, instead of a promoter of, fires. It is interesting to note that to one single item of danger which electricity, in a considerable measure, banishes, viz.: matches, no less than 782 fires are attributed,

involving a loss of $901,147, an average of $1,152, of which 86, involving a loss of $97,442, an average of $1,131, were attributed to the gnawing of matches by mice. While these figures are not directly to be compared, because electricity is not yet in universal use, they are nevertheless suggestive in reply to the mistaken assumption that electricity is a dangerous cause of fires.

Meter Bureau.

The concentration of the meter work, formerly distributed among the several stations, at the new Elm Street Station, in connection with the General Offices, effected at the beginning of the year, has produced excellent results. The Controller has given much personal attention, during the year, to the more thorough organization of the records of this bureau, and the development of its methods. As now organized, each process is checked by a second person, and the record of any one customer or bill can be traced through the system, with almost absolute certainty, in a few minutes. A number of mechanical improvements have also been made in handling the meter business, under the supervision of the Chief Electrician as well as of the Controller. The Company has issued a general invitation to its customers to visit the meter room and inspect its workings at any time. It remains true, nevertheless, that customers will be much better satisfied with a mechanical meter, the results of which can be seen at any time by the consumer. It is intended to put into test, during the present year, a mechanical meter which has come to the attention of the Company, and which, it is hoped, may fulfil the conditions previously laid down of combining the accuracy of the chemical type with the convenience and satisfaction to customers of the visible mechanical record.

Lamp Decisions.

During the year the decisions sustaining Mr. Edison's fundadamental patent on incandescent lamps have been further confirmed and have been strengthened by their application in specific cases. All incandescent lamps which have been adjudicated upon have been declared infringements of the Edison patent, and the most recent decisions have held that such evasions as repairing lamps, as by the Davis method, or admitting gas

after making a vacuum, as in the "Novak" lamp, are as much infringements as the Sawyer-Man, Beacon and other lamps against which injunctions had previously been granted. This Company has been the first to obtain specific application of the general decisions in the cases of rival illuminating companies and of individual consumers heretofore using infringing lamps. Preliminary injunctions have been granted by Judge Lacombe and sustained on appeal by the United States Circuit Court of Appeals in suits against The United Electric Light & Power Company (Westinghouse system) and against The Mount Morris Electric Light Company, restraining them from using infringing lamps on installations made since Judge Wallace's decision in 1891, and the Court has indicated that a like remedy would be granted as to earlier installations, in case the infringing companies should not purchase Edison lamps under reasonable arrangements. As a result of these decisions, negotiations with the rival illuminating companies named above have resulted in the payment of considerable sums of money by them in settlement for their infringement of the Edison lamp patent in the past, and arrangements have been made for the sale of Edison lamps during a term of years for use on existing installations. This Company has not committed itself to providing Edison lamps for any new installations by rival companies. In the cases brought against individual consumers, viz. : the Imperial Hotel, the Holland House and William Zinsser, the important principle was established that this company, as licensee under the Edison patent, was not under obligation to sell Edison lamps except to customers for station current, and while this principle may not be applied by this Company to the full extent permitted by the law, it gives a most satisfactory basis on which to effect favorable settlements, in all cases where the Company decides to supply non-Edison installations with Edison lamps. So far, sales under such circumstances have been made with specific notice that they were not to constitute a precedent for future sales or prices.

Arc Lighting.

While the Edison lamp patents have given this Company a special advantage in the field of incandescent lighting, its development of the field of arc lighting, where it has no such ad-

vantage, has been equally marked. The arc lighting business has been supposed to be peculiarly a field of the high-tension companies, but from the beginning of the Edison arc-light business in 1889, at the end of which year there were but 110 lamps installed, this business has steadily grown, until this Company has now an arc-light installation larger than that of any high-tension Company. During the year, the new arc-light street system devised for Fifth Avenue, has been extended, by increasing the number of posts, and that thoroughfare has been pronounced the best lighted street in this or other cities. The use of small arc lamps for interior lighting, particularly in large stores, has been noticably developed during the year, the installation in the establishment of Hilton, Hughes & Co. (formerly A. T. Stewart & Co), with several hundred arc lights, being a notable example. This method of illumination of large spaces furnishes light very much below the cost of lighting by gas.

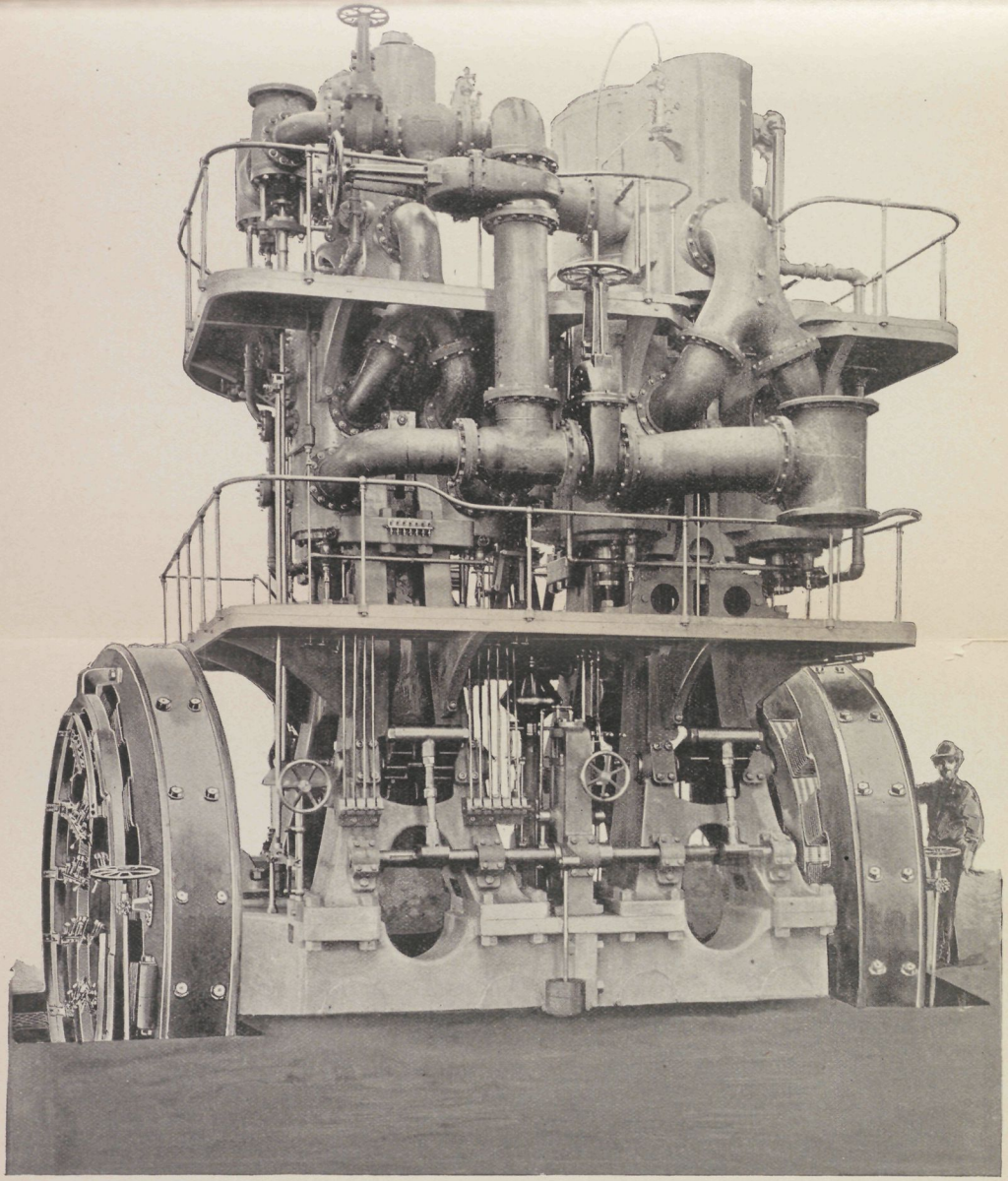
Manhattan and Harlem Companies.

During the past year the business of the Manhattan and Harlem Companies, in which this Company had become largely interested, has had increased attention, with satisfactory results. These companies form a valuable supplement to the Edison system, as their installations are largely in the north-east portion of the city, into which the Edison system does not extend. The returns of the year 1892 for these two companies show increase of net earnings exceeding $23,000 over the returns for 1892, obtained in good part by lowered operating expenses. The companies are now more than earning the interest on their bonded indebtedness and are well under way toward a dividend-paying basis. During the year an annex station has been equipped for the Manhattan Company in 38th street near 7th Avenue, to take care of that portion of its business which is in the southern part of the city, with results in economy of operation which are already evident Provision is being made for completing the work of putting the systems of these two companies entirely underground, and it is expected that this change will be completed within 1894. If the installation of these companies is counted in connection with the Edison installations, the total installations under the care of the officers of this Company exceed the equivalent of 300,000 16 c. p. lamps.

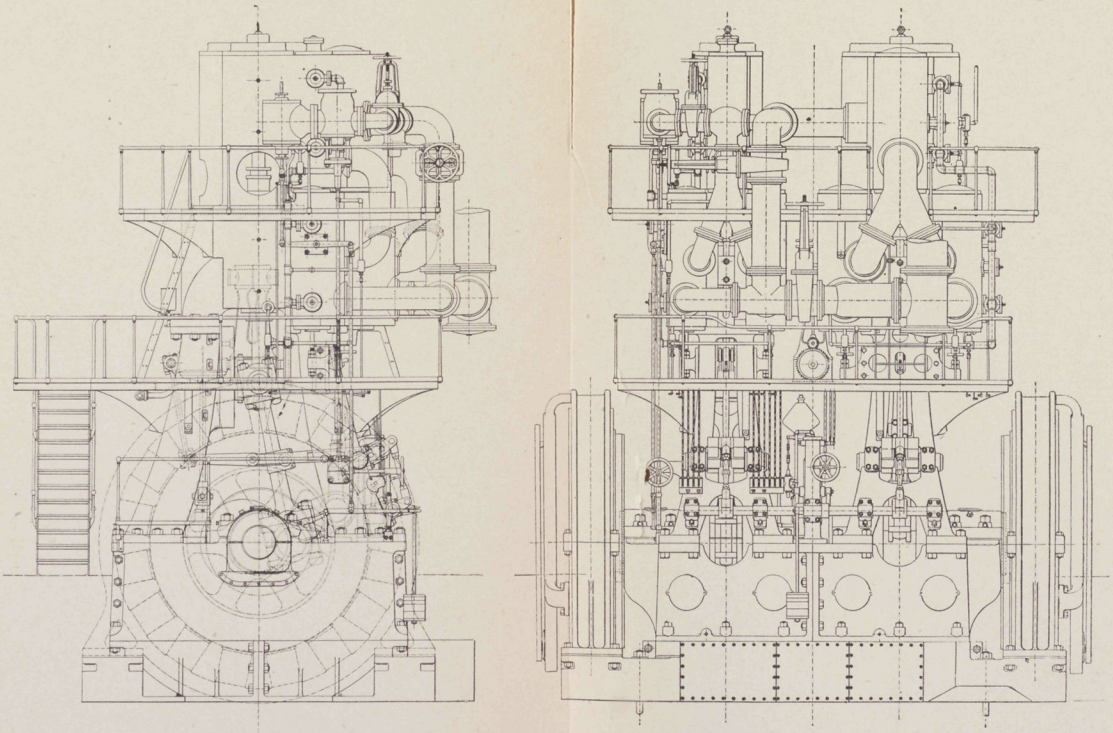
Conclusion.

The investment of the Company's funds, in 1893, aside from the large amount involved in meeting the indirect obligations connected with the acquirement and development of the Manhattan and Harlem holdings, has been chiefly in the erection of the new Elm Street Station, the increase of its equipment, the completion of the equipment of the 26th Street Station and the development of the underground system, especially in the upper Fifth Avenue district. The construction requirements for 1894 will be much less than for 1893, and the investment of funds will be confined to the completion of construction requisite to obtain the highest possible economy in the operations of the stations and to meet the requirements of the increase of business of the year. It is not proposed to enter into new territory until better times assure increased returns. The results of 1893, in face of the hard times and despite the adverse circumstances of the year, have shown that the Company's business is on a basis of steadfast prosperity, and that the economies of customers, even in a year like 1893, have much less effect on its revenues than the influence of hard times has upon most manufacturing business and most industrial corporations. With the natural increase of business, the relative cost of generating current should steadily decrease, and the time should come, and at no distant day, when it will be practicable to reduce the price of current for illumination as well as for other purposes, and make electricity not merely a luxury in private residences, and a convenience and economy in manufacturing establishments, but the general servant of the community, with the result of largely widening the Company's field of operations and of income. To that end the efforts of the Company's staff will be steadfastly directed.

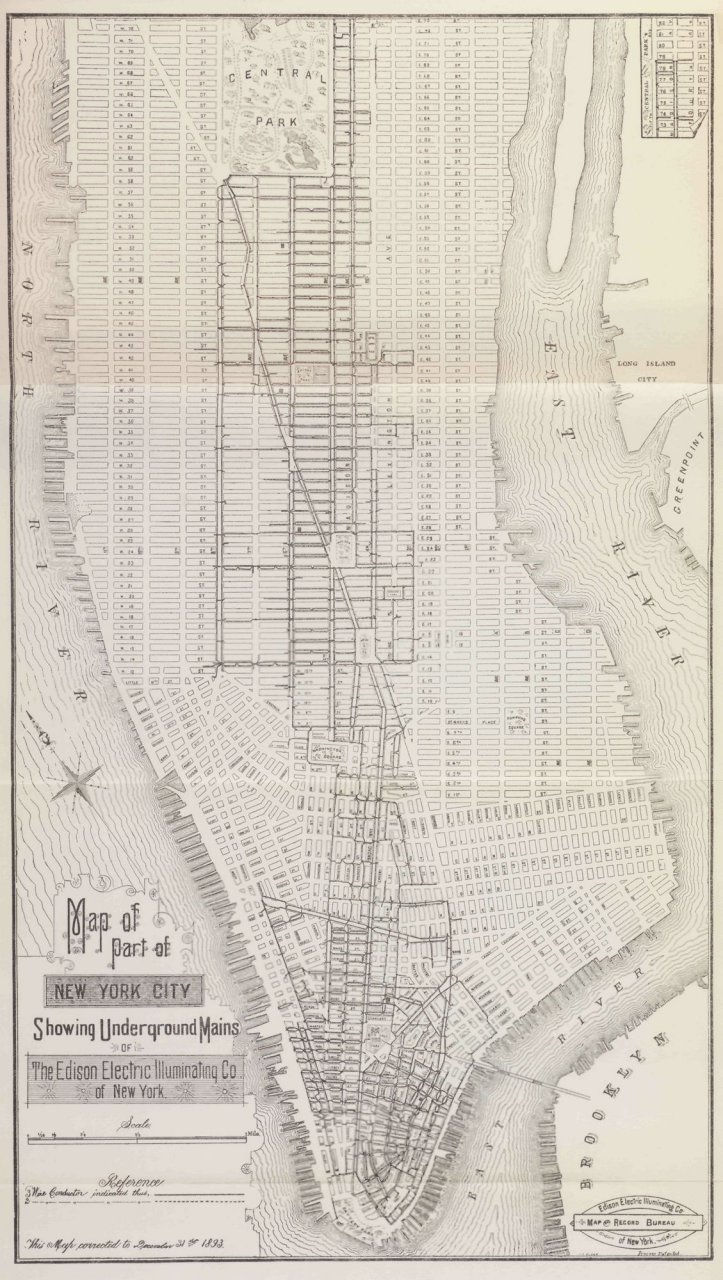
(Signed) R. R. BOWKER,
First Vice-President.



2500 H. P. Van Vleck Disconnective Quadruple Expansion Engine.—New Station.



2500 H. P. Engine.—Sectional Plans.


CENTRAL PARK
NORTH RIVER
EAST RIVER
LONG ISLAND CITY
GREENPOINT
BROOKLYN
Map of Part of
NEW YORK CITY
Showing Underground Mains
OF
The Edison Electric Illuminating Co of New York.
Scale
Reference
Main Conductors indicated thus,
This Map corrected to December 31st 1893.
Edison Electric Illuminating Co.
MAP & RECORD BUREAU
of New York

ANNUAL REPORT

—OF THE—

BOARD OF DIRECTORS TO THE STOCKHOLDERS,

AT THEIR ANNUAL MEETING,

January 15, 1895.

The Edison Electric Illuminating Co. of New York.

Board of Directors—1894.

A. A. H. BOISSEVAIN,
R. R. BOWKER,
C. H. COSTER,
CHARLES E. CROWELL,
THOMAS A. EDISON,
W. E. GLYN,
E. H. JOHNSON,
D. O. MILLS,
GEO. FOSTER PEABODY,
W. A. READ,
F. S. SMITHERS,
SPENCER TRASK,
J. HOOD WRIGHT.

Board of Directors—1895.

A. A. H. BOISSEVAIN,
R. R. BOWKER,
C. H. COSTER,
CHARLES E. CROWELL,
THOMAS A. EDISON,
W. E. GLYN,
GEO. F. GREGORY,
ARTHUR CURTISS JAMES,
D. O. MILLS,
GEO. FOSTER PEABODY,
W. A. READ,
F. S. SMITHERS,
SPENCER TRASK.

Officers:

SPENCER TRASK, - - - - - - *President.*
R. R. BOWKER, - - - - - *First Vice-President.*
GEO. FOSTER PEABODY, - - *Second Vice-President.*
FRANK ENOS, - - - - - - - *Secretary.*
JOS. WILLIAMS, - - - *Treasurer and Ass't Sec'y.*
W. A. RUSSELL, - - - - - - - *Auditor.*

GENERAL OFFICE.

DUANE, CORNER ELM STREET.

STATIONS.

DUANE, COR. ELM STREET,
47-49-51 WEST 26TH STREET,
117-119 WEST 39TH STREET.
118-120-122 WEST 53D STREET.

ANNEX STATIONS.

PRODUCE EXCHANGE, 115 EAST 12TH STREET.

NEW YORK CITY.

NEW YORK, Jan. 15, 1895.

To the Shareholders of

THE EDISON ELECTRIC ILLUMINATING COMPANY OF NEW YORK.

In presenting the figures for the past year, the Directors have to note a continued increase in the business and prosperity of the Company.

The results for the year ending December 31st, 1894, are :

Station earnings were		$1,369,066 72
Operating expenses, including repairs and renewals		550,426 77
Net earnings of stations		$ 818,639 95
Earnings from other sources		32,944 18
Income received from investments		62,325 54
		$ 913,909 67
Less general and legal expenses and taxes		124,443 09
Net earnings of Company		$ 789,466 58
NOTE.—Interest on Bonds	$207,266.67	
Dividends	476,196.00	
	$683,462.67	
The Company has also received Lamp Royalties, accruing previous to 1894 (as a result of decisions in relation to lamp suits), carried direct to Profit and Loss for transfer to Depreciation Reserve Fund		$ 46,000 00

The returns of the business since 1890 have been :

	GROSS.	NET.
1890	$ 488,595 83	$229,078 80
1891	675,505 43	347,228 63
1892	963,021 25	475,137 61
1893	1,245,524 87	605,642 72
1894	1,464,336 44	789,466 58

	1890.	1891.	1892.	1893.	1894.
No. of customers.....	1,698	2,875	4,344	5,154	5,877
No. of lamps, 16 c. p.....	64,174	94,485	142,492	192,691	234,494
No. of motors, h. p.....	697	2,000	3,807	5,529	7,616
No. arc lights.....	254	841	1,637	2,538	3,014

Estimating each motor h. p. and each arc light as equal to ten 16 c. p. lamps, the present installation is equal to 340,784 lamps.

The above figures show that while the gross earnings have increased 17½% over 1893, the net earnings have increased 30% over that year, the ratio of net to gross being 54%, as against 48½% in 1893, and 49% in 1892 and 1891, all of which goes to prove that the larger the scale on which the Company conducts its business the greater is the proportionate economy of operating. The policy of concentrating the down-town supply of current in one large station, and of installing large units whenever practicable, has been productive of decided economies in operating.

The Duane Street Station is now entirely completed structurally. It is sufficiently large to accommodate nearly four times its present mechanical and electrical equipment, and, when fully equipped, to supply nearly four times the present amount of current, so that the chief expense in the future will be for additional generating apparatus and underground conductors. The large unit, *i. e.* the 2,500 horse-power generator installed last year, has been giving good service, and a second unit of this size will probably be installed during 1895.

The up-town district has shown a heavy increase during the year in the demand for current, particularly in the neighborhood of Union Square, for which the 26th Street Station, now equipped with apparatus to its full capacity, would have been unable to provide. Your Directors, therefore, decided early in the summer that it was necessary to arrange at once for an Annex Station south of 14th Street, in accordance with the general plans outlined some years ago. A purchase was accordingly made of a lot on 12th Street, east of 4th Avenue, and, pending the installation of a storage battery which was contracted for, a small generating plant was installed and has been in service during the last quarter of the year. Arrangements have also been made to secure adjoining property, with

a view of erecting a more important Annex Station, which promises to furnish an adequate auxiliary supply at comparatively small station cost.

The Station buildings, with the completion of the 53d Street Station (not necessary until after 1895), should then be sufficient, it is believed, to meet all requirements in that respect, in the territory which they serve, for many years to come. It will be the part of wisdom to utilize this space by installing additional apparatus from year to year, and by such extensions of the underground system as may be required by increased demand, and as shall promise immediate returns in the way of revenue.

The underground extensions of the year have been limited to the immediate necessities of the Company, and consist chiefly of the completion of feeder systems to supply demand in specific parts of the City. The Directors in the new year will have to consider possible extensions of the system west of Central Park. The Company's present network of mains is adequate for largely increased business, so that the cost of underground extension in the future, while large, will be much less than in previous years.

Your Directors have reason to be satisfied with the policy of leaving the wiring business with individual contractors, the number of which in the City is now large. Arrangements have been made to sell, on favorable terms, the stock of the New York Electrical Equipment Company, which was taken in part payment of the wiring supplies transferred to that Company by the old wiring department of this Company. After the sale your Company will have no proprietary connection with the Equipment Company, nor with any contractor for installation work.

The obligations assumed by your Company, in connection with the Manhattan and Harlem purchases, referred to in last year's Report, have been met, including a final payment since the close of the fiscal year, and we now own virtually all the stock of both companies, and a majority of the First Mortgage Bonds of the Manhattan Company. Instead of selling these bonds as was suggested in last year's Report, to cover expenditures made, and to be made, in enlarging and extending the plant of these Companies, it may perhaps be wiser to

adopt some broader scheme which shall provide not only for such expenditures, but also for the needs of your own Company. More definite plans may be submitted later. The operations of the Manhattan and Harlem Companies have resulted in a small increase of gross earnings, and a large decrease in operating expenses, so that in addition to covering their bonded interest, they have earned a sum equal to between 5% and 6% on their floating indebtedness, all of which is held by your Company through the Edison Light and Power Installation Co. This sum is included in the report of your own business, under the heading of "Income from investments." A general revival of business will add further to the revenues of both Manhattan and Harlem Companies, as they serve a class of customers among whom the effects of the hard times have been more pronounced than among the customers of the Edison Company. They usefully supplement the Edison system, especially north of 80th Street.

The Balance Sheet and Statement of Income Account are appended as usual. After paying 6% in Dividends on the Stock, the results of the year (supplemented by $46,000 lamp royalties appertaining to previous years), have warranted the Directors in carrying a sum of $125,000 to "Depreciation Reserve Fund," thus practically reducing the cost of the plant by that amount.

This conservative course will, no doubt, commend itself to the Stockholders.

Particular attention is invited to the report of the First Vice-President herewith.

Your Directors again express their appreciation of the devotion to the interests of the Company which has been shown by the various officers, as well as by the employes of the Company.

By order of the Board of Directors,

SPENCER TRASK,
President.

THE EDISON ELECTRIC ILLUMINATING COMPANY
OF NEW YORK.

DR. INCOME ACCOUNT YEAR ENDING DECEMBER 31ST, 1894. CR.

Dividends paid 1894:		
May 1st	$119,047 50	
August 1st	119,049 00	
November 1st	119,049 00	
Due February 1st, 1895	119,050 50	
		$476,196 00
Bad accounts written off		15,128 71
Interest on Bonds		207,266 67
Depreciation Reserve Fund		125,000 00
Balance		54,668 60
		$878,259 98

Balance December 31, 1893	$42,793 40	
Added for Royalties collected during 1894 which pertain to previous years	46,000 00	
		$ 88,793 40
Net Earnings, 1894		789,466 58
		$878,259 98

E. & O. E.
NEW YORK, December 31st, 1894.

JOS. WILLIAMS,
Treasurer.

THE EDISON ELECTRIC ILLUMINATING COMPANY

OF NEW YORK.

DR. CONDENSED BALANCE SHEET, DECEMBER 31, 1894. CR.

License under Edison Patents		$3,020,000 00	Capital Stock	$10,000,000	
Real Estate, Construction and Property, and other Investment Accounts	$8,201,064 08		Less Treasury Stock	2,062,000	$7,938,000 00
11,164 Shares Edison Light & Power Installation Co.	1,116,400 00		First Mortge. Convertible Gold Bonds	5,000,000	
		9,317,464 08	Less Bonds Converted	688,000	4,312,000 00
Customers' Accounts and Bills Receivable		180,532 83	Accounts payable		68,806 25
Sundry Accounts and Supplies on hand		116,597 64	Sundry Accounts		40,113 86
Cash on hand		177,969 76	Dividend No. 39 (due Feb. 1, '95)		119,050 50
			Accrued Interest		71,866 68
			Depreciation Reserve Fund		208,058 42
			Profit and Loss		54,668 60
		$12,812,564 31			$12,812,564 31

E. & O. E.

NEW YORK, December 31st, 1894.

JOS. WILLIAMS,

Treasurer.

FIRST VICE-PRESIDENT'S REPORT.

NEW YORK January 10, 1895.

Spencer Trask, Esq., President.

THE EDISON ELECTRIC ILLUMINATING COMPANY OF NEW YORK.

SIR:

The year 1894, which in general business has shown lowered earnings and profits, consequent upon the financial stringency of 1893, has shown in the business of this Company most satisfactory results. It is undoubtedly true that there has been a tendency on the part of consumers to economize in the use of light, proportionately reducing the earnings of the Company, but the continued increase of installations throughout 1894 has not only compensated for such reductions but has shown a large absolute increase. The proportionate increase in installations is not of as high percentage as in some years preceding, but the actual increase has been the equivalent of a good sized Company in itself, and increment percentages must necessarily decrease as the Company grows larger. The effect of "hard times" is shown, however, in the fact that the increased output of current has not quite kept pace with the increase in installation; on the other hand, the Company, having completed its large station on Duane Street, is now in a position where its business can grow without proportionate increase in outlay, so that while new investment will be necessary from year to year, as the Company continues to grow, each dollar of expenditure will not only return immediate interest on itself, but will increase the rate of return on every dollar of previous capital in even larger ratio than heretofore.

The concentration of down-town business in the Duane Street station, and the fact that the 26th Street station has been utilized to its entire capacity of supply, have combined to reduce the percentage of operating expenses effectively, and the general im-

provement throughout the operation and administration leave the Company, notwithstanding the pressure of "hard times," in remarkably strong and satisfactory condition.

The following table shows the net increase in the several classes of installation and in earnings in the past year, and also in the past five years:

	1894. Dec. 31.	1893. Dec. 31.	Inc. in 1 year.	Per ct. Inc.
Customers	5,877	5,154	723	14
Inc. Lamps.....	234,494	192,691	41,803	22
Arcs.....	3,014	2,538	476	19
Motors, h. p.....	7,616	5,529	2,087	38
Tot. 16 c. p. eq...	340,784	273,361	67,423	25
Gross returns....$1,464,336.44		$1,245,524.87	$218,811.57	17½
Net returns.....	$789,466.58	$605,642.72	$183,823.86	30
Prop. net to gross	54%	48½%		

	1894. Dec. 31.	1889. Dec. 31.	Inc. in 5 years.	Times Incr.
Customers.....	5,877	1,213	4,644	3⅞
Inc. Lamps.....	234,494	39,815	193,679	4⅞
Arcs.	3,014	110	2,904	26
Motors, h. p.....	7,616	470	7,146	15
Tot. 16 c. p. eq..	340,784	44,515	296,269	6⅔
Gross returns... $1,464,336.44		$329,773.60	$1,134,562.84	4½
Net returns.....	$789,466.58	$124,031.97	$665,434.61	6
Prop. net to gross	54%	38%		

These figures reckon a standard arc lamp as the equivalent of ten 16 candle-power incandescent lamps, and a horse-power in motors also as the equivalent of ten 16 candle-power incandescents, although the rating in other companies is as high as fifteen 16 candle-power lamps per horse-power. None of the figures given include those of the Manhattan and Harlem Companies, which are operated under the supervision of this Company, and which have an installation equivalent to approximately 35,000 16 c. p. incandescent lamps additional. These figures show that the Company more than holds its lead in comparison with other illuminating companies. The next largest installations are those of the Chicago Edison Company in this country, and of the company in Berlin, Germany, also direct current, low-tension. The latest report of the Berlin company, 30th June, 1894, shows

2,580 customers ; " number of lamps, or their equivalent in current " 190,400, to which 1,364 h. p. in motors seem to be additional, and an ampere output of 57,500,000 amperes in the year 1893-4. The installations of the Edison Company in New York City are now nearly three times as large as those of all the other electric illuminating companies of this city combined. The increase in customers' installations, as has been noted, is somewhat less than the increase in 1893 ; this is undoubtedly owing to the fact that building operations were checked toward the close of 1893, so that there have been fewer new buildings in 1894 to demand current.

The following table shows the returns from current for each district (I. down-town, II. up-town) for each month, not including the Company's general expenses, outside of operating expenses, or its outside sources of revenue :

1894	FIRST DISTRICT.			SECOND DISTRICT.		
Month.	Gross Earnings.	Expenses.	Net Earnings.	Gross Earnings.	Expenses.	Net Earnings.
Jan ...	$59,055.13	$22,133.33	$36,921.80	$75,191.58	$27,748.27	$47,443.31
Feb ..	58,210.40	18,393.30	39,817.10	63,865.23	23,052.40	40,812.83
Mar ..	52,946.19	20,932.86	32,013.33	55.894.33	22,339 64	33,554.69
April .	54,959.69	18,696.89	36,262.80	54,913.53	22,667.05	32,246 48
May ..	46,501.22	18,662.78	27,838.44	48,656.93	21,841.11	26,815.82
June. .	46,202.68	18,561.93	27,640.75	44,345.09	21,387.89	22,957.20
July ...	45,077.56	18,355.67	26,721.89	41,056.84	18,917.93	22,138.91
Aug . .	48,928.68	20,098.46	28,830.22	41,347.05	22,459.55	18,887.50
Sept ..	53,058 72	19,703.49	33.355,23	47,406.90	22,146.75	25,260.15
Oct ...	59,553.66	24,010.94	35,542.72	62,583.05	28,161.66	34,421.39
Nov ..	68,177.28	23,136.35	45,040.93	76,602.09	29,975.67	46,626.42
Dec...	70,142.03	27,324.46	42,817.57	94,390.86	39,718 39	54,672.47
	$662,813.24	$250,010.46	$412,802.78	$706,253.48	$300,416.31	$405,837.17

The gross returns show an increase in greater proportion up-town than down-town, though the operating conditions down-town are so much more favorable as still to show greater net returns in the lower than in the upper district. This result is due in part to the concentration of operations down-town in one large station, but still more to the fact that the proportion of motors down-town is much the larger, affording a steadier load during the day and from month to month. The up-town dist-

rict has a much greater proportion of incandescent lamps, many of them in residences which are closed entirely during the summer, and its monthly returns vary greatly from a general average, being from June to September inclusive much below the gross returns in the down-town district and in the winter months much above. The down-town district had December 31, 1894, 3,686 customers, using 76,159 incandescent lamps, 1,124 arc lamps, and 4,971 H. P. in motors, supplied through 79½ miles of feeders and mains. The up-town district had December 31, 1894, 2,191 customers using 158,335 incandescent lamps. 1,890 arc lamps and 2,644 H. P. in motors, supplied through 112 miles of feeders and mains. It is interesting to note that while the gross earnings for current in both districts have gone from $1,193,338.91 in 1893 to $1,369,066.72 in 1894, an increase of $175,727.81 return from current, the operating expenses proper have increased only from $527,311.68 to $550,426.77, an increase of $23,115.09, showing an increase of operating net from $666,027.23 to $818,639.95, a betterment of $152,612.72.

Station Equipment.

The Duane Street Station building, which had been erected to its full height at the close of last year, has been completed in its general features, and the General Offices are now permanently established on the upper floors. All the operating machinery in the down-town district, with the exception of the two small units in the Produce Exchange Annex, is now concentrated there, and the historic Pearl Street Station has been abandoned and dismantled of its entire equipment, and the realty offered for sale. The 2,500 h. p. Van Vleck disconnective engine, which represents our largest type of unit, has been put in service during the year in the Duane Street Station, as well as an additional 600 h. p. engine, intended ultimately for the upper district, making the present steam equipment one 2,500 h. p. engine, two 1,250 h. p. engines, and three 600 h. p. engines, a total of 6,800 h. p. Steam is supplied by eleven of the new double-deck Babcock & Wilcox boilers, in their permanent place on the boiler room floor. The Station is thus equipped to less than one-third its final capacity, and the down-town district can be supplied for years to come without further investment in station

realty. The Station is now operated from its permanent electrical platform, equipped with the new Van Vleck "edgewise" apparatus, which permits remarkable centralization of control in the smallest possible space. The Duane Street Station has now a working capacity of about 4,400 k. w., or 33,000 amperes, and the Produce Exchange Annex a capacity of 2,000 amperes.

The 26th Street Station was equipped with its full complement of machinery last year, but considerable improvements have been made at the switchboard and in the electrical fittings. It has now a rated capacity of approximately 20,000 amperes. The 39th Street Station has been further equipped, some of the machinery of the old Pearl Street Station having been transferred to it. It has now ten engines of a total of 2,250 h. p., and nine boilers, about two-thirds of its final equipment, and it has a working capacity of 12,400 amperes. It has been run throughout the year as a one-watch annex, and besides supplying the large opera and theatre installations in its own neighborhood, has supplemented the 26th Street Station through the tie-feeders, of which a third has been provided during the year by re-arranging existing feeders. The 53d Street Station has also had some additions to its equipment, partly from the old Pearl Street machinery, and has now a capacity of 3,500 amperes, exclusive of storage battery. This station is not yet in permanent shape, but the development in the up-town district has not been sufficiently rapid during 1894 to require the development of final plans for the 53d Street Station in 1895, although some increase will be necessary in its equipment.

The great demand for electric current is at the southern portion of each district, down-town below the Duane Street Station and up-town below the 26th Street Station. The Duane Street Station is well located and is of adequate size to supply the down-town district, and the development of demand in the region between Canal Street and 8th Street will doubtless make increasing requirement upon it up to the final limits of its capacity. The 26th Street Station, however, reached its full equipment last year, and for the past two years it has been helped out at the time of maximum load from the 39th Street Station. The section of the city in which the demand for electric current is greatest and the supply least is that from 14th to 23d

Streets, inclusive, and it became, therefore, a pressing question whether additional building should be undertaken at 26th Street, or whether some provision should be made south of 14th Street, where a station had originally been proposed in the neighborhood of 8th Street. In view of the undesirability of duplicating the 26th Street Station, either at the east or north of the present building, and the costliness of running adequate feeders from that locality, it was decided to make an annex installation in 12th Street, and for that purpose arrangements were made by which the Company has come into possession of the property 115 East 12th Street, and will acquire later the adjoining properties, 117 and 119 East 12th Street, whence the present feeder system may be tapped to good advantage at a minimum cost. A contract was made with the Electric Storage Battery Company, of Philadelphia, for the installation of a storage battery there in time for the winter's load, but legal questions arose (as to the result of which this Company was amply protected by its contract) which delayed the installation of the battery. These legal difficulties were removed during the latter part of the year by a consolidation of the rival storage battery interests, but it had not seemed wise for this Company to await the legal results, and, therefore, arrangements were made with the Storage Battery Company, protecting this Company against loss in placing a temporary generating installation, under which a generating plant, including a 500 h. p. engine and two 60 k. w. generators (the latter transferred from the down-town district), were placed in the lower portion of No. 115 East 12th Street. This plant was rapidly installed and was started in November, 1894, greatly relieving the neighborhood to the north, and enabling 26th Street Station to care for its load more effectively and economically. The result has been one of increased saving to the Company and of increased satisfaction to its customers. It has become evident that this is a proper center for further supply, and plans are now under consideration which, at a minimum investment, will provide for a station on a new plan, combining the best features of the horizontal types of station, and giving room for an equipment approximately as large as that of the 26th Street Station. The erection of such a station, and the completion, subsequent to 1895, of the 53d Street Station, should provide the

Company for years to come with all the stations necessary to cover the territory from the Battery to 79th Street.

Operating Department.

The down-town district, including the Duane Street Station, the old Pearl Street Station, run as an annex until its final discontinuance in July, and the Produce Exchange Annex, reached in 1894 a maximum load of 27,500 amperes, December 11th, the equivalent of over 65,000 16 c. p. lamps lighted at one time. The maximum current supplied by this district in 1893 was 24,400 amperes; in 1892, 21,000 amperes; in 1891, 13,550 amperes; and in 1890, 8,340 amperes. The best daily average of the year was 9,823 amperes, December 12th. The best average in 1893 was 8,829 amperes; in 1892, 7,906 amperes; in 1891, 5,200 amperes; and in 1890, 3,382 amperes.

The up-town district, including the 26th Street Station, and the 12th, 39th and 53rd Street Stations, run as annexes, reached during the year a maximum load of 33,200 amperes, December 15th, the equivalent of 78,500 16 c. p. lamps. The maximum load of this district in 1893 was 27,330 amperes; in 1892, 20,320 amperes; in 1891, 15,100 amperes; and in 1890, 9,045 amperes. The best daily average of the year was 12,598 amperes, December 22d. The best daily average in 1893 was 10,673 amperes; in 1892, 7,473 amperes; in 1891, 7,300 amperes; and in 1890, 3,142 amperes.

At the several stations the maximum load of the year was reached at the Duane Street Station, December 11th, with 25,500 amperes; at the old Pearl Street Station, January 15th, with 3,600 amperes; and at the Produce Exchange Annex, January 29th, with 2,800 amperes; at the 12th Street Station, December 5th, with 2,600 amperes; at the 26th Street Station, November 15th, with 19,750 amperes; at the 39th Street Station, November 30th, with 11,200 amperes; and at the 53d Street Station, December 30th, with 4,930 amperes.

The highest load of the entire system taken together was on December 10th, a maximum of 57,450 amperes. The best daily average of the system was on December 22d, 21,647 amperes.

The total amperage of the year was in the down-town district,

52,034,308 ampere hours, and in the up-town district 55,013,553 ; in both districts a total of 107,047,861 ampere hours.

Underground Installation.

The mileage of the under-ground street system December 31, 1893, was, on the 3 wire system, 62.11 miles of feeders and 122.04 miles of mains, a total of 184.15 miles of the 3-wire system ; and on the 2-wire system, 2.53 miles of feeders and .74 miles of main, a total of 3.28 miles. The total mileage December 31, 1893, including 1.36 miles of cable feeders contiguous to the stations, was 187.43 miles of mains and feeders. The system also included December 31, 1893, 1085 junction boxes at intersections.

During the year 1894, in the down-town district, 2.24 miles of 3-wire feeders have been laid, and .37 removed, an increase of 1.87 ; and 2.70 miles of mains have been laid, and .25 miles removed, making an increase of 2.45 miles. Of the old 2-wire feeders in the down-town district, 2.41 miles have been removed and but .41 feet laid (to make certain connections) making a decrease of 2.40 miles ; and .35 miles of mains have been removed and none laid. This leaves but 0.13 miles of feeders and .39 miles of mains of the old 2-wire system, in all .52 miles of 2-wire conductors.

In the uptown district 1.93 miles of feeders have been laid and .63 removed and 2.62 miles of mains laid and 1.08 removed, making an increase of feeders of 1.30 miles and in mains of 1.54 miles, a total increase of 2.84 miles, all 3-wire, in the second district. The removal of feeders and mains up-town was chiefly due to replacement with larger conductors of the small tubing used in some streets when the up-town system was first laid.

The net increase of the system, in both districts, is 4.41 miles, bringing the grand total December 31, 1894, to 191.84 miles. The increase in junction boxes has been 22, making a total of 1107.

The number of service connections added during the year was (net) 329 in the down-town district, and 331 in the up-town district ; in both 660.

Inspection Department.

The Inspection Department has continued to handle satisfactorily the business of new contracts and of customers' complaints,

formerly entrusted to a General Agent's Department, in addition to its technical work of testing house installations and the Company's underground construction, inspecting motors and like work. During the year 220 construction firms or wiremen have reported installations, involving no less than 2,708 reports. Most of the installations made by contractors of experience and good standing were generally up to the standard now carefully enforced by the Company and by the insurance authorities, but much alteration and improvement were requisite in the case of many of the smaller installations made by wiring firms or individual wiremen who had been driven by stress of hard times from positions with employing contractors, into seeking employment for themselves direct from the customers, often at prices which did not permit of good work. It has been the cordial desire of the Company to treat all contractors alike, and to give to new comers every opportunity to establish themselves in our territory, as every new contractor is more or less an agent for the extension of our business, but the Company must insist on the best workmanship and the highest standard of insulation, and in some few cases it has been necessary to enforce these requirements in work done by contractors of experience who had endeavored to meet the class of competition referred to by themselves doing inferior work. The great body of these installations have been made by 21 contractors who have installed the equivalent of over 1,000 lights each, the New York Electric Equipment Company, Charles L. Eidlitz, the Tucker Electric Construction Company, J. L. Chapin (constructing largely for Messrs. Otis Brothers & Company, electric elevators), the Western Electric Company, the Metropolitan Electric Equipment Company, and Hatzel & Buehler, coming successively in order, each having placed the equivalent of over 2,500 16 c. p. lamps on our system during the year.

Electric motors of no less than forty different types were placed on our system during the year, the largest addition being of the Eickemeyer motors, used chiefly in connection with the Otis elevators, of which type 92 installations, aggregating 1,191 h. p., were added ; of the "C. & C.," and the Crocker-Wheeler types of motors for general service ; and of the Lundell type of motors, chiefly for fans, of which 270 individual motors, mostly of small size, aggregating 150 h. p., were connected. The Eddy,

A. B. See (chiefly for elevators), Edison, Perret, Keystone, Sprague, "C. & P.," and Thomson-Houston motors were also added in considerable aggregate to our system.

The arc lamps installed upon the system have been chiefly the Bergmann lamp, made by the General Incandescent Arc Light Company, the Ward lamp, made by the Electrical Construction and Supply Company, and the Clark lamp, made by the Clark Electric Company, although other types of lamps have been accepted for service on our system in accordance with the general policy of promoting electrical development.

In the equipment for the year are included installations for storage batteries, cookery, type-setting machines, cloth cutters, electro-plating, dental apparatus and medical and surgical purposes.

General Offices.

In April, 1894, the General Offices of the Company were removed to their permanent quarters on the seventh and eighth floors of the Duane Street Station, where all the fiscal, administrative and technical business of the Company is now centralized in such wise as to increase greatly the economy and efficiency of the Company's general staff. The General Offices are reached from the Duane Street main entrance by a high-speed Sprague electric elevator. The general entrance is through a hallway on the seventh floor, which opens into a large central hall lighted by day from a skylight above, and ultimately at night by an electric system which will be planned to show the best methods of illuminating public halls and art galleries. At the entrance of this central hall is place for an information attendant and other hall boys and for the telephone central service of the building. All the officers and other representatives of the Company with whom the public have to deal are on the main or seventh floor; above them on the gallery or eighth floor are the clerks and other employes with whom the public have no relations.

The executive offices, with rooms of the First Vice-President, Secretary and Assistant General Manager, occupy the Duane street front of the building and will ultimately be arranged to show the most approved features of electric lighting

and other service in a modern residence. The fiscal offices of the Company occupy the eastern side and the offices of technical administration the western side.

On the east side of the central hall, the room of the Treasurer and the Auditor affords the only entrance to the Cashier's room and to the vault, both of which are thus under the direct control of the important fiscal officers. The Cashier's room, which has cash windows directly facing the general entrance, includes place for the Company's collectors, so that the entire cash transactions of the Company are thus arranged with the utmost convenience and security. The space next to the stacks has been utilized as a fireproof vault for the records of the Company. Above these fiscal offices and reached from them by a private stairway is the Book-keeping room.

On the west side of the central hall are, in succession, the offices of the Controller, Inspection Department, Operating Department and Installation Department, so arranged that each department is next to that with which it has most business relation, and with continuous passages through the several offices, as well as direct entrance to each room from the central hall. Above the Operating and Installation Departments is the Drafting-room, where the work of the Bureau of Engineering and Record is done under the superintendence of the Chief Electrician and Consulting Engineer.

The front portion of the office floors is separated from the rear portion by a fire-wall, and the rear portion of the eighth floor is occupied by the Laboratory and Testing Room on the west side and the Meter Room on the east side. The new Meter Room has been arranged to concentrate the entire meter business of the Company under the eye of the Chief of the Bureau, while giving to each part of the work a separate working place; which is accomplished by means of glass partitions separating the several divisions. The entire arrangement is such as to permit the bottles, the plates and the records to take a continuous path in the course of the usual operations, so that there may be a maximum of work with the minimum of handling.

This statement of the arrangement of the offices is made as an illustration of the complete systematization of the Company's business, and to make known that those interested in the Company are cordially invited to inspect its offices, and particularly

its Meter Room, where any consumer may readily trace for himself the proof of the correctness of any bill rendered.

Relations with Employes.

The relations of the Company with its employes have continued in general of the most satisfactory character. In 1894, as in 1893, a benefit dividend was paid to all employes in the week preceding Christmas, at the rate of three per cent. on their annual salaries or wages to those who had been in the service of the Company for five years in good standing, and two per cent. to those of three year's service, and one per cent. to those of one year's service.

Manhattan and Harlem Companies.

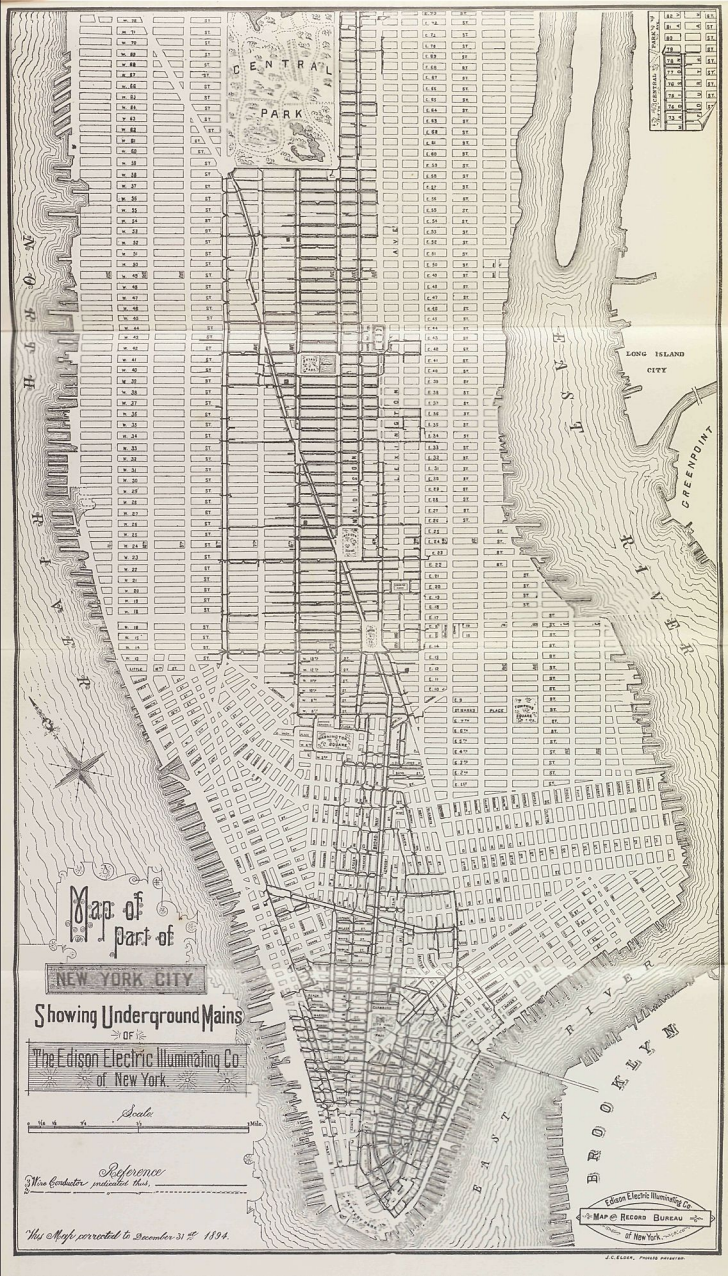
During 1894 the high-tension business of the Manhattan and Harlem Companies, with which this Company is closely related, has not kept pace with the increase in low-tension business, although it is believed that their development has compared favorably with that of other high-tension companies. The gross returns have increased somewhat above those of 1893, and the operating expenses have been handled with noticeable increase of economy and efficiency, so that the net earnings of 1894 covered not only the bonded interest but something over 5 per cent. on the floating debt, all of which is held by the Edison Installation Company. During the year the work of putting the systems of both these Companies entirely underground has been completed, so that there is now no overhead system whatever directly or indirectly under the control or supervision of this Company. This policy was adopted as soon as the Edison Company came into relation with the companies above named, in accordance with its desire to carry out the policy of the city authorities, and to bring everything in connection with it to the highest electrical standard.

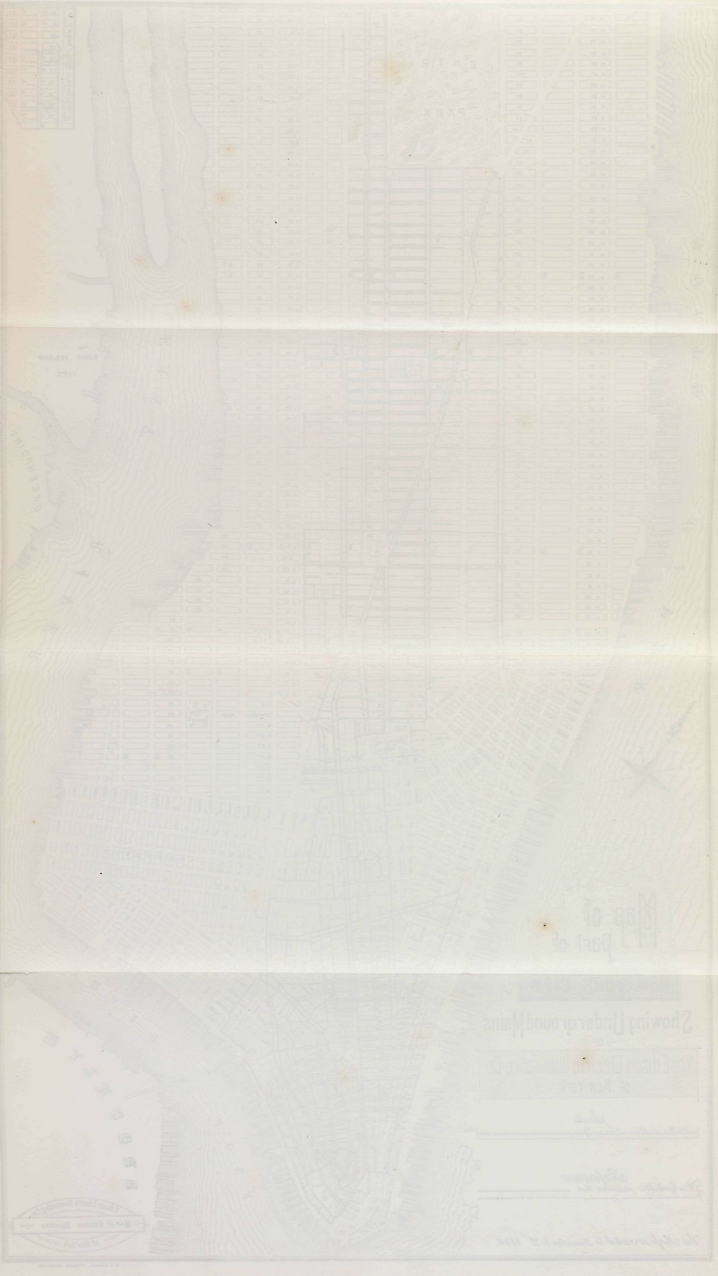
Conclusion.

The year in general has not been one of exceptional or extraordinary development, nor is such development expected during

1895, but the steady increase of the Company's business in the face of "bad times," coupled with the steady decrease of its operating expenses, give the best possible assurance of the solidity of the present investment and of future success. The marked contrast between the returns from railroad corporations during 1894 and such figures as this company is enabled to present shows that the increasing confidence of investors in some of the corporations outside the railroad field is more and more justified by the evidence of results.

(Signed) R. R. BOWKER,
First Vice-President.


CENTRAL PARK
NORTH RIVER
EAST RIVER
LONG ISLAND CITY
GREENPOINT
BROOKLYN
EAST RIVER
Map of Part of
NEW YORK CITY
Showing Underground Mains
of
The Edison Electric Illuminating Co
of New York.
Scale
Reference
Wire Conductor indicated thus,
This Map is corrected to December 31st 1894.
Edison Electric Illuminating Co.
Map & Record Bureau
of New York



ANNUAL REPORT

—OF THE—

BOARD OF DIRECTORS TO THE STOCKHOLDERS,

AT THEIR ANNUAL MEETING,

February 11, 1896.

The Edison Electric Illuminating Co. of New York.

Board of Directors—1895.

A. A. H. BOISSEVAIN,
R. R. BOWKER,
C. H. COSTER,
CHARLES E. CROWELL,
THOMAS A. EDISON,
W. E. GLYN,
GEO. F. GREGORY,
ARTHUR CURTISS JAMES,
D. O. MILLS,
GEO. FOSTER PEABODY,
W. A. READ,
F. S. SMITHERS,
SPENCER TRASK.

Board of Directors—1896.

A. A. H. BOISSEVAIN,
R. R. BOWKER,
C. H. COSTER,
CHARLES E. CROWELL,
R. FULTON CUTTING,
THOMAS A. EDISON,
W. E. GLYN,
ARTHUR CURTISS JAMES,
D. O. MILLS,
GEO. FOSTER PEABODY,
W. A. READ,
F. S. SMITHERS,
SPENCER TRASK.

Officers.

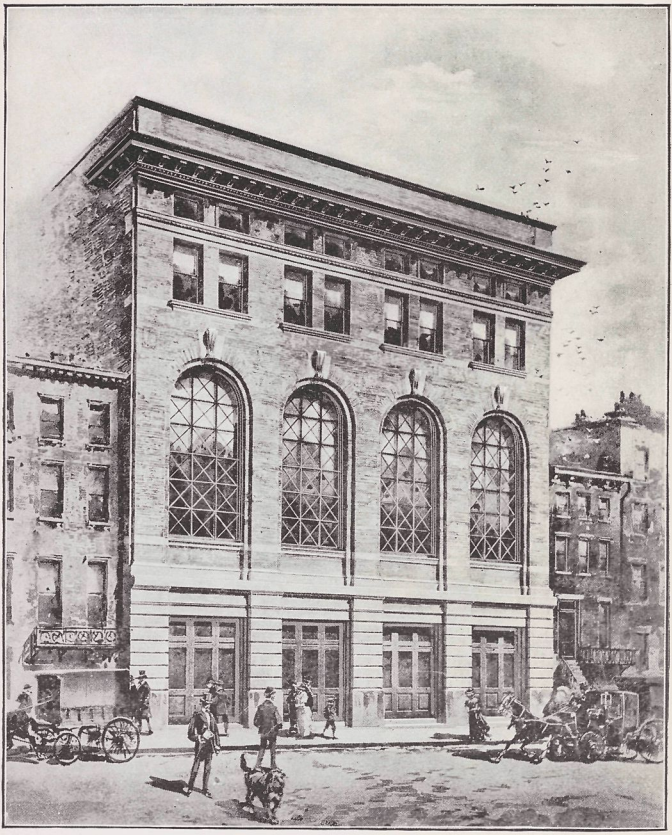
SPENCER TRASK, - - - - - - *President.*
R. R. BOWKER, - - - - - *First Vice-President.*
GEO. FOSTER PEABODY, - - - *Second Vice-President.*
FRANK ENOS, - - - - - - - *Secretary.*
JOS. WILLIAMS, - - - *Treasurer and Ass't Sec'y.*
H. M. EDWARDS, - - - - - - *Auditor.*

GENERAL OFFICE.

53, 55 AND 57 DUANE STREET.

STATIONS.

53–55–57 DUANE ST.,
115–117–119 EAST 12TH ST.,
47–49–51 WEST 26TH ST.,
117–119 WEST 39TH ST.,
118–120–122 WEST 53D ST.,
PRODUCE EXCHANGE, ANNEX.



TWELFTH STREET STATION.—FROM THE ARCHITECT'S DRAWING.

NEW YORK, Feb. 11, 1896.

To the Shareholders of

THE EDISON ELECTRIC ILLUMINATING COMPANY OF NEW YORK.

In presenting the figures for the past year, the Directors have to note a continued increase in the business and prosperity of the Company.

The results for the year ending December 31st, 1895, are:

Station earnings were	$1,544,822 78
Operating expenses, including repairs and renewals	541,051 27
Net earnings of stations	$1,003,771 51
Earnings from other sources	18,955 46
Income received from investments	111,453 21
	$1,134,180 18
Less general, office, technical and legal expenses and taxes	218,421 44
Net earnings of Company	$ 915,758 74

NOTE.—Interest on Bonds....$268,550 00
Dividends..... 76,209 50

$744,759 50

The returns of the business since 1890 have been.

	GROSS.	NET.
1890	$ 488,595 83	$229,078 80
1891	675,505 43	347,228 63
1892	963,021 25	475,137 61
1893	1,245,524 87	605,642 72
1894	1,464,336 44	789,466 58
1895	1,675,231 45	915,758 74

	1891.	1892.	1893.	1894.	1895.
No. of customers	2,875	4,344	5,154	5,877	6,675
No. of lamps, 16 c. p.	94,485	142,492	192,691	234,494	271,123
No. of motors, h. p.	2,000	3,807	5,529	7,616	12,046
No. arc lights	841	1,637	2,538	3,014	3,424

Estimating as heretofore, that each arc light and each h. p. in motors equals ten 16 c. p. lamps, the present installation is equal to 425,823 lamps, as against 340,794 last year. As the results of a new rating agreed upon by the larger Edison Companies, and of a general survey made in 1895, a new basis of accounting will be adopted from January 1, 1896, as stated in the report of the First Vice-President.

The above figures show an increase in gross earnings of 14½% and in net earnings of 16%, the ratio of net to gross being 54⅔%, a slight advance over last year.

The gross earnings of the last quarter of 1895 show less percentage of increase than heretofore, partly because of the unusual amount of clear weather during that period as compared with the same period during the previous year and partly owing to the general depression of business in the latter part of the year. A careful investigation has been made as to the use of improved methods of gas-burning, but these do not appear to have made serious inroads upon the Company's business or development.

The concentration in large stations and other economies of operation, have shown results in a steadily decreasing cost of current as delivered at the switchboard.

Most careful and thorough investigations and computations were made in the latter part of the year as to the superior economy of taking a supply current from the central stations instead of from isolated plants, and, as a result, the Bowling Green Building, covering an area of 200 x 160 feet, now in course of erection on Broadway, New York, after having contracted for an isolated plant, has cancelled the contract and arranged with this Company to supply current, the difficulties of extreme distance from the station being met by the use of a storage battery, which will be economically charged during the hours of minimum demand upon the station and street conductors.

The second 2,500 h. p. generator is now installed in the Duane Street Station, which thus for the first time has adequate surplus power.

The new 12th Street Station has been erected, and is in process of equipment.

During the year, arrangements were made in Europe for the

purchase of two steam turbine generators which promise valuable results in connection with electric stations. One of these is being installed at 12th Street and one at 39th Street stations. They have the advantage of furnishing a large amount of power in small space.

A large storage battery is also being installed at the 12th Street Station, which is expected to have important results in the economies of the Company.

The system of connecting the several stations by tie-feeders which can be utilized, by the new device of a controllable junction box, so as to serve also as supply-feeders, has been carried forward with increasingly good results in the economies of the service

By help of such improvements, it was possible to discontinue the operation of the 39th Street Station entirely during the summer of 1895, and it is hoped with the aid of the storage batteries and the tie-feeders to confine active operating work still more closely in the summer of 1896.

The underground system has been but little extended during 1895, beyond requirements for specific customers. There has, however, been an increasing demand in the part of the City between Canal and 8th Street, and the growing requirements of business here and elsewhere have necessitated some extension of feeders as well as mains.

It is not expected during the year 1896 to make large developments either in station equipment or in underground service, but the Company will be prepared to make such additions and extensions as may be justified by actual demands.

Under a contract with the City, Madison Avenue, from 59th to 79th Streets, will be lighted by the Company on the system developed for Fifth Avenue.

During the year your Directors have caused to be purchased and paid for all the securities of the Madison Square Light Company—known previously as the Thomson-Houston and originally as the East River Electric Light Company—and have extended the purchases of Manhattan and Harlem Companies' bonds, so that only $64,000 in bonds now remain outside of this Company's possession. This will enable the practical consolidation of these several companies, with increased economies, as a high-tension division of

this Company's operations. This investment is showing a good income which is partially included in the report of your own business under the head "Income from investments." It is expected in 1896 to make such reorganization and development of these companies as will add to your Company's income from investments in their securities.

At the time of the last annual report, your Directors were giving their attention to the formulation of a comprehensive financial scheme to provide for the profitable extension of your Company's plant, from year to year, in accordance with legitimate business requirements. As a result, a special meeting of the stockholders was called for May 1st, 1895, and, prior thereto, a circular embodying the views of the Directors was issued. The following is an extract therefrom :

> During the past years the Company has been necessarily extending its plant to embrace the most profitable sections of the City. This work has now been largely accomplished, and it is not expected that in the early future the Company will find advantage in extending beyond present territorial limits, but it is more and more evident to your Directors that valuable opportunities exist for further development within these limits, and that, in the future, as in the past, and even in more marked degree, such development will yield a steadily augmenting ratio of return on the capital invested.
>
> Since the last annual report, your Board of Directors have given careful consideration to the question of future development and it seems to them that a point has now been reached where the Company should adopt some comprehensive financial scheme which, while surrounded with every safeguard, shall provide for the legitimate requirements of the Company for a series of years to come, and, at the same time, leave the largest possible margin of profit for the capital stock.
>
> The result of these deliberations is that the Directors have determined to ask the stockholders, in accordance with the enclosed notice, to authorize the creation of a mortgage under which bonds can be issued from time to time, possibly in connection with future issues of stock, as the needs of the Company may require.
>
> The law under which your Company is organized provides that the bonded indebtedness of the Company shall not exceed the amount of its outstanding, paid-up capital stock, or an amount equalling two-thirds of the value of the Company's property in the event of such two-thirds exceeding the Company's capital stock. This just requirement would prevent, in any case, an immediate issue of any unduly large amount of bonds, but it has been thought desirable, in arranging for a new mortgage, to make the amount named in the mortgage large enough to provide for future contingencies. It is, therefore, proposed that the mortgage shall be for the sum of $15,000,000.

Of the bonds secured by the proposed mortgage—

$4,312,000 are to be reserved to pay off at, or before, maturity, the existing Mortgage Bonds of the Illuminating Company.

502,000 are to be reserved to pay off the existing Mortgage Bonds of the Manhattan Electric Light Company and the Harlem Electric Light Company other than $573,000 Manhattan & Harlem Bonds recently acquired by this Company, and which will be pledged under the new mortgage.

1,686,000 are to be used to reimburse the Company for outlays recently made for the final payment on its purchases of stocks and bonds of the Manhattan and of the Harlem Companies, and to provide funds for the construction requirements of the Companies during the present year.

8,500,000 bonds will remain in the Treasury for future use.

The mortgage will provide that none of these last-mentioned bonds shall be issued before January 1st, 1896, but that they may be issued from time to time thereafter, for the purpose of new construction and acquisition, to an extent not exceeding $1,000,000 in any one year, but with a restriction that the entire bonded debt of this and the previous issues shall at no time exceed the amount of outstanding paid-up capital stock. It will also contain carefully drawn provisions regulating the use of these reserved bonds.

$15,000,000 TOTAL.

At this meeting the proposed mortgage was unanimously authorized by the vote of all stockholders present or represented, and the necessary steps to give effect to such authority have been duly taken. During the year, $2,118,000 bonds, secured by the new mortgage, have been issued and disposed of, viz.:

$1,686,000 immediately issuable as above.

432,000 used to acquire a like amount of Manhattan & Harlem bonds which were outstanding at the time of the creation of the mortgage (part of the $502,000 above noted).

The Balance Sheet and Statement of Income Account are appended. In accordance with their usual policy, after paying 6% in Dividends, your Directors have carried $100,000 to the Depreciation Reserve Fund.

It has been the practice of this Company for some years to pay its employes at the close of the year, in recognition of their

fidelity and to stimulate good work and economy in the year to come, a labor benefit amounting to from 1 to 3 per cent. on yearly wages, according to length of service with the Company. Instead of paying this as wages, your Directors have this year set aside, to cover this payment in 1895, $10,000, leaving a small balance in the employes benefit account which will be useful in the same direction.

Attention is called to the report of the First Vice-President, presented herewith.

Your directors record with sorrow the loss by death during the year of their valued associate, Mr. Geo. F. Gregory, who during his brief term of service had given careful and valuable attention to your interests.

By order of the Board of Directors.

SPENCER TRASK,
President.

THE EDISON ELECTRIC ILLUMINATING COMPANY
OF NEW YORK.

DR. INCOME ACCOUNT YEAR ENDING DECEMBER 31ST, 1895. CR.

Dividends paid 1895:		
May 1st	$119,050 50	
August 1st	119,050 50	
November 1st	119,053 50	
Due February 1st, 1896	119,055 00	
		$476,209 50
Interest on Bonds		268,550 00
Bad accounts written off		33,004 40
Depreciation Reserve Fund		100,000 00
Employes' Benefit Account		10,000 00
Balance		72,016 61
		$959,780 51

Balance December 31st, 1894	$54,668 60	
Less adjustment of accounts previous years	10,646 83	
		$ 44,021 77
Net Earnings 1895		915,758 74
		$959,780 51

E. & O. E.

NEW YORK, December 31st, 1895.

JOS. WILLIAMS,
Treasurer.

THE EDISON ELECTRIC ILLUMINATING COMPANY
OF NEW YORK.

DR. CONDENSED BALANCE SHEET, DECEMBER 31, 1895. CR.

License under Edison Patents		$3,159,000 00
Real Estate, Construction, Property and other Investment Accounts	$9,912,650 07	
12,164 Shares Edison Light & Power Installation Co.	1,216,400 00	
		11,129,050 07
Customers' Accounts and Bills Receivable.		130,361 01
Sundry Accounts and Supplies on hand		106,442 38
Cash on hand		585,988 69
		$15,110,842 15

Capital Stock	$10,000,000	
Less Treasury Stock	2,062,000	
		$7,938,000 00
First Mtge. Conv Gold Bonds	$5,000,000	
Less Bonds Converted	688,000	
		4,312,000 00
First Consol'd Mortgage Gold Bonds		2,118,000 00
Accounts Payable		80,293 55
Dividend No. 43, (due Feb. 1, 1896)		119,055 00
Suspense Account (unsettled license)		62,000 00
Accrued Interest Account		71,866 68
Insurance Reserve		15,389 78
Employes' Benefit Account		2,090 00
Sundry Accounts		29,608 96
Depreciation Reserve Fund		290,521 57
Profit and Loss		72,016 61
		$15,110,842 15

E. & O. E.

NEW YORK, December 31st, 1895.

JOS. WILLIAMS,
Treasurer.

First Vice-President's Report.

New York, January 10, 1896.

Spencer Trask, Esq., President

THE EDISON ELECTRIC ILLUMINATING COMPANY OF NEW YORK.

Sir:

The year 1895 has been one of continued prosperity for this Company, and it is satisfactory to note that, despite unfavorable conditions of general business and exceptionally clear weather in the later months, there has been a gratifying increase of returns. The year 1893, with its severe strain on business, proved that this Company has a stable revenue in the face of the most adverse commercial conditions; the year 1895, which opened under very favorable circumstances, has suffered in the latter portion from a similar business depression, necessarily producing an economy in the use of illuminants and of power, and the output of the Company has been seriously curtailed because of the unusually bright weather during the months of September, October and December. In the daylight working hours, *i. e.*, from 8 A. M. to half an hour after sunset, in the four months September–December, the proportion of cloudy hours in 1894 was 41.4 per cent., and in 1895 only 28.1 per cent., a difference of over 45 per cent. in favor of 1894, from the point of view of lighting supply. These causes together operated to keep down the gross revenue during the last four months of 1895, from lighting sources, in comparison with the year 1894. The extraordinary development of motor business on the Company's system in 1895, partly the result of the encouraging commercial conditions of the early part of the year, in good part offset this limitation of output. Though the return per unit of current is less on the motor service, it has the advantage of longer hours of use, and consequently better utilization of the Company's plant. The increase of 14½ per cent. in gross and 16 per cent. in net returns in 1895, though proportionately lower than the increase in installation is, like the result in 1893, the

best proof that under the most adverse of circumstances the investments of this Company are steadfastly productive.

The following table shows the net increase in the several classes of installation and in earnings in the past year, reckoning, as heretofore, a standard arc lamp as the equivalent of ten 16 c. p. incandescent lamps and a horse-power in motors as the equivalent of ten 16 c. p. incandescent lamps.

	1895. Dec. 31.	1894. Dec. 31.	Increase in 1 year.	Per ct. Inc.
Customers	6,675	5,877	798	12
Inc. Lamps.	271,123	234,494	36,629	16
Arcs.....	3,424	3,014	410	13
Motors, h. p.....	12,046	7,616	4,430	58
Tot. 16 c. p. eq...	425,823	340,794	85,029	25
Gross returns....	$1,675,247.62	$1,464,336.44	$210,911.18	14½
Net returns	$915,758.74	$780,466.58	$126,292.16	16
Prop. net to gross	54⅔%	54%		

The figures above recorded include some but not all of the isolated plant installations for which this Company furnishes a supplementary supply. The number of customers to some extent represents as separate customers lighting and motor installations. During the year 1895 the Annual Survey, hereafter described, has resulted in an accurate accounting both of lamps and motors continuously on our system, and of isolated plant installations supplied from our system during minimum hours or for emergencies. The following table gives the specific and exact facts, as of January 1, 1896, regarding customers, buildings supplied, meters, incandescent and arc lamps and motors on our system, discriminating between the two classes above noted. The rating of a horse-power, as equivalent to only ten 16 c. p. incandescent lamps, hitherto adopted by this Company, gives place to a rating of fifteen 16 c. p. lamps, bringing this Company's rating into line with that agreed upon during the year as the result of consultations among the larger Edison companies. These figures will hereafter be taken as the standard for reporting increases from year to year.

	Central Station Service.	Isolated Plant Service.	Total Service.
Customers	5,705	59	5,764
Buildings	3,883	59	3,942
Meters	7,243	91	7,334
Sockets	225,293	60,965	286,258
Incandescent lamps	218,877	59,694	278,571
Inc. lamps, 16 c. p. equiv.	227,974	63,027	291,001
Arc lamps, number	2,964	777	3,741
Arc lamps, 8 ampere equiv.	3,226	777	4,003
Motors, h. p.*	11,640	886	12,526
Total Equivalent	434,834	84,087	518,921

* NOTE.—Miscellaneous equipments, such as heaters, organ control, physicians' apparatus, etc., are included in h. p.

These figures do not include those of the high-tension companies operated under the supervision of this Company and constituting practically the high-tension division of this Company. The purchase of the securities of the Madison Square Light Company, formerly the Thomson-Houston Company of New York, and previously to that the East River Electric Light Company, has now brought under the control of this Company three high-tension systems, viz.: those of the Manhattan, Harlem and Madison Square companies. These three companies had on their station service January 1, 1896, 27,751 incandescent and 2,075 arc lights, or an equivalent of 48,501, which, added to the Edison station service, gives a total of 483,335, or, with isolated plant service, 567,422 16 c. p. equivalent.

The next largest installations in the world are that of the Chicago Edison Company, which, at the close of 1895, had on its system 191,074 incandescent, 2,698 low tension and 1,854 high tension arc lamps, and 5,546 h. p. in motors, a total equivalent of 314,329 16 c. p. equivalent; and that of the Berlin (Germany) Electrical Works (also on the Edison system), which, at the close of its fiscal year, July 1, 1895, reported 2,930 customers and 236,400 16 c. p. equivalent, which may or may not include its 663 motors of 2,366 h. p., an equivalent of 36,490 16 c. p.

The following table shows the returns from current for each district (I. down-town, II. up-town) for each month, not including the Company's general expenses or its outside sources of revenue.

1895	FIRST DISTRICT.			SECOND DISTRICT.		
Month.	Station Earnings.	Operating Expenses.	Station Net.	Station Earn ngs.	Operating Expenses.	Station Net.
Jan. . .	$74,216.39	$22,837.90	$51,378.49	$91,341,61	$31,244.84	$60,096.77
Feb . .	66,424.10	21,163.02	45,261.09	75,058.89	29,249.92	45,808.97
Mar . .	61,096 42	19,415.19	41,681.23	67,927.25	26,676.38	41,250.87
April .	61,505.94	15,886.48	45,619 46	65,754.81	25.448.59	40,306.22
May. .	57,430.33	16,199.46	41,230 87	61,451.63	23,711.46	37,740.17
June. .	57,080 51	14,339.87	42,740 64	55,070.52	21,294 26	33,776.26
July . .	55.874.38	15,494.76	40,379.62	44,804.57	20,118.61	24,685.96
Aug . .	56.028.07	15.039.14	40,988.93	43,319 42	21,446.13	21.873 29
Sept. .	59,812.08	16.077.97	43,734.11	51,368 73	25,799 96	25,568.77
Oct . .	60,874.47	19,766.66	41,107.81	60,218.48	30,646.01	29,572.47
Nov . .	74,247.47	18,075.35	56,172.12	77,902.60	34,270.51	43,632.09
Dec . .	76,823.09	19,428 09	57,395.00	89,191.02	37,420 71	51,770.31
	$761,413.25	$213,723.89	$547 689.36	$783,409.53	$327,327.38	$456,082.15

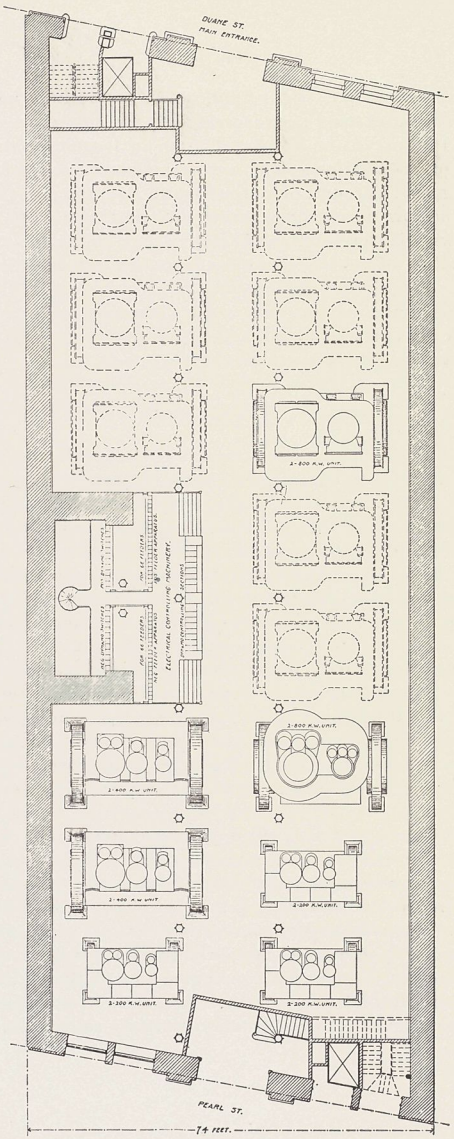
The gross returns this year, contrary to those of 1895, show greater increase down-town than up-town. This is owing to the fact that the increase in motor installations was chiefly in the down-town district, while the up-town district, which depends chiefly upon illuminating returns, was more affected by the clear weather of the fall. These differing circumstances also account for the fact that the first district shows greater steadiness of earnings throughout the twelve months, while the second district shows in January and December more than double the earnings of July and August, when the days are long and many residences are closed. The down-town district had December 31, 1895 (on the old reckoning) 4,130 customers, using 87,711 incandescent lamps, 1,355 arc lamps and 8,398 h. p. in motors, supplied through 85¼ miles of feeders and mains. The up-town district had December 31, 1895, 2,545 customers, using 183,412 incandescent lamps, 2,069 arc lamps and 3,648 h. p. in motors, supplied through 117⅔ miles of feeders and mains. It should be noted that while the gross earnings for current in both districts have gone from $1,369,066.72 in 1894 up to $1,544,822.78 in 1895, an increase of $175,756.06 return from current, the operating expenses, as shown, have gone from $550,-426.77 down to $541,051.27, a decrease of $9,375.50. The operating charges have been lessened by the transfer to general expenses of certain charges, now included under the head of

general technical, not strictly applicable to operating; but they have on the other hand been increased by including throughout the year the cost of the first installation of incandescent lamps and by other transfers. The net result shows a decrease of operating cost per unit of output which is extremely satisfactory. The low operating expenses and cost of current in the down-town district show more clearly than before the wisdom of the policy of the Directors in concentrating production in the large Duane Street Station, and also the value of the motor business, despite the fact that it pays less per unit of current than lighting business, in utilizing the Company's plant to the best advantage during the daylight hours.

Station Equipment.

The Duane Street Station equipment has been extended during 1895 by the addition of a second 2,500 h. p. quadruple expansion engine, made by the Southwark Foundry and Machine Company of Philadelphia, with two 800 k. w. General Electric Company's generators, and by the transfer from the Produce Exchange annex of one of the two 200 h. p. McIntosh & Seymour engines, making the total equipment at the Duane Street Station 9,550 h. p., or 6,200 kilowatts, and at the Produce Exchange Annex 200 h. p., or 200 kilowatts. The present arrangement of the Duane Street operating-room is shown on the ground-plan annexed. A new double-deck Babcock & Wilcox boiler of unusual size, fourteen rows of tubes high, with three drums, has also been installed, adding 553 h. p. to the boiler equipment. This equipment gives abundant supply and reserve for the year 1896, and no new generating machinery will be required in this station until 1897.

The 26th Street Station reached its full equipment and capacity two years ago, and has been supplemented this year by the completion of the new 12th Street Station, as hereafter described. Improvements have been made in the electrical controlling apparatus, and water-cooling apparatus is in process of installation on the roof. The 39th Street Station equipment has been reduced by the transfer of one 150 h. p. engine to 53d Street Station, and increased by one 163 h. p. boiler, in preparation for the addition of a turbo-generator, and has now a working capacity of 2,100



GROUND PLAN OF OPERATING-ROOM.—DUANE STREET STATION.

h. p., or 11,500 amperes For the first time in the history of the Company, this station has been discontinued during the minimum season, *i. e.*, from May into October, by help of the tie-feeders, supplying its neighborhood from the 26th and 53d Street Stations. The 53d Street Station has also had additions to its equipment, including an engine from 39th Street Station and boilers removed from the old Pearl street station, and has now a capacity of 900 h. p. and 4,400 amperes, exclusive of the storage battery, which has been in service during the year both for additional supply during the maximum hours and for regulating purposes during the day. It is not expected to purchase new generating machinery for any of these stations during the year unless unexpected increase of business should make that desirable, with the exception of the development of the 12th Street Station equipment.

Twelfth Street Station.

The increasing demand in the portion of the city south of the 26th Street Station, the equipment of which was completed two years ago, made it desirable, as stated in the last annual report, to provide for a station in East 12th Street which would supplement 26th Street Station by supplying current in the Union Square neighborhood, and would help out also the upper part of the down-town district, during one watch, covering the maximum hours of the day. Accordingly, the Company acquired, early in the year, the property No. 117 and 119 East 12th Street, adjoining No. 115, already owned by it, in which a generating unit had already been temporarily installed, and developed for the new station, a plan of a somewhat new type, intended to combine the advantages of a horizontal station with some of the features of the existing stations, built on a vertical plan adopted where the high cost of land or the difficulty in acquiring sufficient land made that arrangement preferable. Ground was broken in April and erection begun in May, 1895, and the structure completed before the close of the year. A view of the new 12th Street Station is given as the frontispiece of this report from the drawing of the architects, Messrs. Buchman & Deisler. The facade is intended to show in exterior design the interior construction and to combine simplicity with good taste. The ground plan is equally divided between a boiler-

room on the west and an operating-room on the east side. These rooms are made high to give abundant ventilation, and the building contains only one additional story, occupied above the boiler-room by the coal bunker, and above the operating-room by the storage battery and auxiliary apparatus.

The construction of the station is on the skeleton or "Chicago" method, the entire weight of the upper story and roof being carried by Phœnix steel columns, with brick construction for partitions and side fillings only. An important advantage of this method is that a station of this type can be enlarged on either side at a minimum cost. The columns divide the boiler-room and the engine-room into six bays, each providing on the one side for one boiler, and on the other side for one generating unit. Each pair of boilers is connected with its own steel stack, of which there are three in all, thus avoiding horizontal boiler flues and waste of heat. These boilers are of Babcock & Wilcox construction, of a type very short and high, developed expressly for use at this station, and each boiler, corresponding with one generating unit, feeds into a line of steam piping, built in sections, which will however connect any one boiler with any generating unit as desired. All the boilers are capable of working at 225 lbs. pressure. The coal for the boilers is fed, as in the vertical stations, through chutes coming from the coal bunker directly above the boilers, to which coal is elevated by a Jeffreys coal-hoisting apparatus. The boiler-room has been equipped with one-half the final equipment of boilers.

Each of the six bays of the engine-room provides space for a 600 or a 1250 h. p. triple-expansion engine, but the present equipment is temporary only, having been utilized during the past winter pending the test of the new generating apparatus, the turbine-dynamos, of which one set is in process of installation at this station. The controlling gallery occupies space at the front or south side of the operating-room, and connections with it are made chiefly through hollow tile channels, provided for in the construction of the building. Above this gallery is the booster-room, in connection with the storage battery, which battery occupies half the second floor above the engine-room, leaving a space at the back permitting doubling of the battery, should that prove desirable. To secure the economy incident

to condensing engines or turbines, water-cooling apparatus of the Barnard type is in process of installation on the roof. The second story is reached by a combined passenger and freight elevator of A. B. See type.

Careful provision has been made for the ventilation both of the boiler-room and engine-room, and for the isolation of the storage battery-room from heat effects, so that the whole station may, in its methods of operation, show the most improved and economical methods of operating. This station, built at a minimum of cost for land and for construction, will, when completely equipped, approximate the capacity of the 26th street station, and would provide for nearly double that capacity, if it should ever become desirable, by the simple device of removing the brick side fillings and extending the steel column construction.

Storage Batteries.

The increasing use abroad, particularly in Germany, of the storage battery in connection with central station service, caused this Company in 1893 to make a pioneer installation of a storage battery, of the English Crompton-Howell type, in its 53d street station, which has proved exceedingly useful, both as a reserve and as means of regulation. It was determined, therefore, to make a storage battery a feature of the new 12th Street Station, and, as stated in the last annual report, a contract was made with The Electric Storage Battery Company of Philadelphia for a battery of 8,000 ampere hours, or four times the size of that of the 53d Street Station. Litigation delayed in the installation of this battery in the temporary station last year, but it has now been installed and is nearly ready for operation in its permanent place in the new station. Meantime, the Battery Company has become possessed of rights under other patents, so that our own Company has the advantage of obtaining a battery combining the chloride negative plate and a pasted (Tudor) positive plate, a combination likely to give especially good results under our conditions of use. Should this storage battery fulfill expectations, it is probable that storage battery annexes will be provided at extreme parts of the system down-town and up-town, thus enabling the present generating system of the Company to supply its territory at best advantage and highest economy without the building of additional stations. Preliminary arrangements have

already been made for the installation of such a battery in the Bowling Green Building, now in course of erection, to replace the Produce Exchange generating annex. By help of the storage battery, it will be practicable, as already stated, to confine the operation of the 12th Street Station to one watch in the day, and possibly to supply the down-town district, with the aid of a Bowling Green annex battery, during Sundays and part of the nights, without operating the Duane Street Station.

Turbo-Generators.

For some years this Company has been watching alertly the development of steam turbines, of which a successful type was exhibited at the Chicage World's Fair in 1894. During the past summer, I made a careful inspection abroad, in England, France and Sweden, of the development which steam turbines in their electrical applications had shown, visiting every electric light station in which turbines were operated, as well as the works in which they were constructed, in England, and also the works and some of the installations in Sweden and France. Both the English (Parsons) type and the Swedish (de Laval) type, manufactured in Paris as well as at Stockholm, proved of good promise. One of the most important London supply stations had replaced reciprocating engines with turbines of the Parsons type and the de Laval type was in extensive use both in Sweden and in France. Arrangements were made with the Societe de Laval, Paris, for the manufacture by the well-known Maison Breguet, one of the oldest and most highly reputed manufacturing houses in France, of two 300 h. p. turbo-generators combining in one unit a 300 h. p. steam turbine with two dynamos, one for the positive and one for the negative side. These units have the advantages, over the ordinary electrical combinations of steam engines and dynamos, of greater compactness, less original cost, and entire absence, it is claimed, from vibration, and the installation of this new type of apparatus, the first in this country, is a practical step forward of much importance.

Water-Cooling Apparatus.

Careful attention was also given in my investigations abroad to the various devices for the cooling of condensing water, which is of peculiar importance at most of our stations,

since our more modern machinery is adapted for use condensing as well as non-condensing, and a large saving in steam consumption is practicable when engines can be run condensing. The distance of our stations from the water side, and in some cases the absence of any water-bearing stratum under them, makes this development a very desirable one for this Company. Several methods were in effective use abroad, and the Brooklyn Edison Company had experimented successfully with an apparatus developed by the well-known Worthington establishment, which, however, had the disadvantage of great weight and large ineffective absorption of water. A method developed by Mr. Geo. A. Barnard, of the Buckeye Engine Company, Salem, O., in which the water to be cooled was trickled over woven wire meshes and an alternative method devised by the Worthington establishment, in which galvanized iron tubes replaced the heavier tile, seemed to promise advantages superior to those of any of the European systems, and contracts were therefore made to place a Barnard water-cooling apparatus on the roof of the 12th street station, capable of supplying two turbo-generators, and a Worthington water-cooling apparatus on the roof of the 26th street station, capable of supplying the several triple expansion units there. There is every reason to suppose that this experiment will prove successful, in which case it will not only add materially to the economies of the system, but will permit an increase of the electrical output of the 26th Street Station without increase in boiler capacity.

Operating Department.

The down-town district, including the Duane Street Station and the Produce Exchange Annex, reached in 1895 a maximum load of 31,550 amperes, December 30th, the equivalent of over 74,000 16 c. p. lamps lighted at one time. The maximum current supplied by this district in 1894 was 27,500 amperes; in 1893, 24,400 amperes; in 1892, 21,000 amperes; and in 1891, 13,550 amperes. The best daily average of the year was 10,769 amperes, November 25th. The best average in 1894 was 9,961 amperes; in 1893, 8,829 amperes; in 1892, 7,906 amperes; and in 1891, 5,200 amperes.

The up-town district, including the 26th Street Station, and the 12th, 39th and 53rd Street Stations, run as annexes, reached

during the year a maximum load of 37,820 amperes, December 19th, the equivalent of nearly 90,000 16 c. p. lamps. The maximum load of this district in 1894 was 33,200 amperes; in 1893, 27,330 amperes; in 1892, was 20,320 amperes; and in 1891, 14,300 amperes. The best daily average of the year was 14,973 amperes, December 21st. The best daily average in 1894 was 12,598 amperes; in 1893, 10,673 amperes; in 1892, 7,473 amperes; and in 1891, 7,300 amperes.

At the several stations the maximum load of the year was reached at the Duane Street Station, December 30th, with 30,550 amperes; at the Produce Exchange Annex, January 16th, with 2,000 amperes; at the 12th Street Station, December 19th, with 5,000 amperes; at the 26th Street Station, December 19th, with 21,600 amperes; at the 39th Street Station, December 18th, with 10,500 amperes; and at the 53d Street Station, November 29th, with 5,340 amperes.

The highest load of the entire system taken together was on December 23d, a maximum of 66,810 amperes. The best daily average of the system was on December 20th, 24,214 amperes.

The total amperage of the year was in the down-town district, 55,388,146 ampere hours, and in the up-town district 65,660,140; in both districts a total of 121,048,286 ampere hours.

Underground Installation.

The mileage of the underground street system December 31, 1894, was, on the 3-wire system, 65.28 miles of feeders and 126.03 miles of mains, a total of 191.31 miles of the 3-wire system; and on the 2-wire system, 0.13 mile of feeders and 0 40 mile of main, a total of 0.53 mile. The total mileage December 31, 1894, including 1.39 miles of cable feeders contiguous to the stations, was 191.84 miles of mains and feeders. The system also included December 31, 1894, 1,107 junction boxes at intersections.

During the year 1895, in the down-town district, 1.10 miles of 3-wire feeders have been laid, and .06 removed, an increase of 1.04; and 5.33 miles of mains have been laid, and 0 37 mile removed, making an increase of 4.96 miles. Of the old 2-wire feeders in the down-town district, the remaining 0.13 mile has been removed, and 0.16 mile of mains has been removed. This leaves but 0.24 mile of mains of the old 2-wire system. The net increase in the first district is 5.71 miles.

In the up-town district 3.03 miles of feeders have been laid and .60 removed and 3.62 miles of mains laid and .68 removed making an increase of feeders of 2.43 miles and in mains of 2.94 miles, a total increase of 5.37 miles, all 3-wire, in the second district. The removal of feeders and mains up-town was chiefly due to replacement with larger conductors of the small tubing used in some streets when the up-town system was first laid.

The net increase of the system, in both districts, is 11.08 miles, bringing the grand total December 31, 1895, to 202.92 miles. The increase in junction boxes has been 53, making a total of 1,160.

The number of service connections added during the year was (net) 365 in the down-town district, and 321 in the up-town district; in both 686.

Tie-Feeder System.

During the year the tie-feeder plan has been developed, in connection with the new controllable junction box devised by this Company, so that the underground system has greater flexibility and practically a greater capacity than ever before. This plan involves the connection of adjoining stations with two or more continuous feeders connected directly from the switchboard of one station to the switchboard of the other, by which any one of the stations can be supplied from the station north or south of it. Two such tie-feeders now exist between the Duane and 12th Street Stations, 12th Street and 26th Street Stations, 26th Street and 39th Street Stations, and, though not yet in permanent form, 39th Street and 53rd Street Stations. This system has been of great use in making it possible to shut down 39th Street Station during the entire summer, in providing for the help of adjoining stations in case of emergencies at any one station, and in supplementing the supply from any one center of distribution at maximum hours by direct help from another station.

The new device of the controllable junction box permits these tie-feeders to be separated into ordinary supply feeders, if desired, during the maximum hours. A pair of these boxes is to be placed in each feeder about midway between stations, each box containing apparatus, under control from the station switchboard, by which the continuity as ties can be broken and the conductors attached to the mains. Thus a tie-feeder ruuning

from the Duane Street Station through the 12th Street Station to the 26th Street Station is broken practically into four supply feeders, one supplying north from Duane Street, one south from 12th Street, one north from 12th Street and one south from 26th Street, practically multiplying by four the carrying capacity of each tie-feeder between stations, since the capacity of a conductor is doubled at half distance.

Annual Survey.

During the past year the Inspection Department, in addition to its other work, has made a general survey, which it is proposed to repeat annually, of all the installations on the Company's system. This has included careful personal examination by competent inspectors of about 4,000 buildings, which have been tested for insulation, as well as like tests of every section of feeders and mains throughout the underground system. This survey has produced most valuable results; it has given gratifying proof that the great number of installations on our system are in thoroughly satisfactory electrical condition and it has been the means of pointing out both to customers and to the insurance authorities the few installations on which the insulation was lower than the proper standard. The general results of this survey have been reported to the insurance authorities from time to time and specific results put at their disposal as desired. This annual survey is of equal value to the consumer and to the supply Company, and its methods and results have been very satisfactory to the insurance authorities also.

In addition to inspection by this Company of new installations coming on our system, which is preliminary to inspection by the insurance authorities, a third inspection has been organized within the year, under a law of 1893, by a Bureau of the Fire Department, representing the City authorities. The triple inspection has been of some annoyance to our customers and has caused some delay in the supply of current, since this Company is not at liberty to turn on current until the certificates both of the insurance and of the city authorities have been obtained. It is believed, however, that these several inspections may be organized ultimately so as not to duplicate each other or to cause unnecessary delay in supplying consumers with the current.

Inspection Department.

The Inspection Department has continued its usual work, combining the functions of a General Agent with that of the General Inspector, with satisfactory results, as is shown both by the increase of business and by the freedom of any serious annoyance to customers from defective installations. During the year no less than 270 construction firms or wiremen have reported installations, involving 2,895 reports. Of these, nine contractors have made installations aggregating over 1,000 lamps each in the year past, these being in order of the total equivalent installed : New York Electric Equipment Co., Randolph & Sullinger, Tucker Electric Construction Co., Miner & Co., Zimdars & Hunt, Metropolitan Electric Equipment Co. (now consolidated with the New York Electric Equipment Co.), Western Electric Co., Globe Electric Construction Co. and Conduit Wiring Co.

Of electric motors, in which the development during 1895 has been exceptional, no less than 47 types have been installed on our system. The Lundell type, manufactured by the Interior Conduit and Insulation Co., chiefly for ventilating fans, shows the largest number of motors; the Eickmeyer type, manufactured for Otis Bros. & Co., chiefly in connection with their elevators, stands first in the aggregate horse-power installed. The varied purposes for which electric power is used increases year by year, but the most remarkable development of 1895 has been in the use of electric elevators, for which 112 motors aggregating 1,268 h. p. have been installed for the Otis type, 50 motors of 422 h. p. for the A. B. See type, and 26 motors of 287 h. p. for the Sprague type, besides others of various types.

Isolated Plants.

Of the large office buildings, factories, etc., within the territory of this Company, having isolated plants, no less than fifty-nine are now taking supplementary service from this Company, which contracts to supply such buildings either during minimum hours when isolated plants operate at great disadvantage, at the Company's regular rates, or for emergency use only with a guarantee from the owner of a certain revenue per month to the Company whether current is used or not, this guarantee being based upon the number of lamps and the possible demand for current at any one time.

There has been a general belief, encouraged perhaps by electrical contractors, that isolated plants could be run at a lower cost than that of the corresponding supply of electric current from a central station, and there has been a consequent tendency to install isolated plants in many of the larger buildings. In many cases the estimate of cost was quite fallacious because so many of the real elements of investment and operating were left out from the calculation, so that owners were not fully informed of the cost of isolated supply. To meet this difficulty, this Company has prepared a blank on which a builder or owner may figure for himself the actual operating cost of an isolated plant. The Company has also, during the past year, introduced a rate for larger installations, using their lamps a considerable number of hours per day, which has reduced the cost of this Company's supply to a point at which it is difficult for isolated plants to compete.

The proposed Bowling Green building on lower Broadway was at so considerable a distance, electrically, from the Duane Street Station, that there seemed at first some doubt, owing to the demand for current from the Wall Street neighborhood upon the street conductors in the lower part of the city, whether this building could be supplied without undesirable investment in underground conductors for use solely during the few hours of maximum demand. This difficulty was overcome, however, by the plan of installing a storage battery which should not only provide for that building during the maximum hours, but would take the place of the present Produce Exchange generating annex. Under present conditions, the tendency of owners to install isolated plants has been definitely checked and a number of installations have returned or are likely to return to our system, as the cost of producing current and the cost of the supplementary connection necessary to give to the local service the certainty afforded by central station supply, together exceed the service rates of the Company.

Meter Bureau.

The Meter Bureau has been ably handled by the Controller during the year in addition to the important work of his Department as the purchasing agency of the Company and the division in charge of construction accounts and the working

order system. The Meter Bureau had in its charge on installations upon our system and in connection with isolated plants, on January 1st, 1896, 7,334 meters, of the Edison chemical type. The Bureau is now thoroughly well organized and is handled with great accuracy at a decreased cost per meter, notwithstanding the careful system of double checking by which each step in the Meter Bureau is accompanied.

Very careful attention has been given to complaints from customers, as to amount of bills, etc., involving questions connected with the meter, and in two cases in the past year as well as in one case in the preceding year, disputed accounts have been submitted to arbitration, with the understanding that the expert employed as arbiter should give a thorough examination to our meter methods, from the installation of the meter in the customer's house to the rendering of the bill. In both cases, as in the previous instance, after the consumer had made his nomination of an expert to represent him, the Company accepted such expert as its own arbiter and agreed to abide by his decision. The experts in these two cases made careful investigation and presented to the consumer detailed reports, of which copies were filed with this Company, and in both cases the accuracy of the meter record was fully vindicated. Many tests of the Edison chemical meter have also been made in the testing room of the Company with remarkable results in confirmation of its accuracy under varying circumstances.

It remains true, nevertheless, that the mechanical meter has a considerable advantage in the fact that it can be read from time to time by the consumer, and when bills have been questioned, in the case of large installations, this Company has been willing to introduce a mechanical meter for a test period in series with the chemical meter, the mechanical meter being calibrated by the manufacturer to make its record entirely independent of this Company. In each case the mechanical meter has proven to read somewhat higher and apparently less accurately than the chemical meter. Nevertheless, the desirability of a mechanical meter which should combine the accuracy of the chemical meter with the advantage of a visible dial, is constantly kept in mind by the Company's experts, and it is hoped that a new mechanical meter (now passing out of the experimental stage), the

result of much experience on the part of those familiar with the Edison system, may develop so that it may be adopted by this Company.

While the chemical meter as a scientific instrument is of extraordinary accuracy, it is nevertheless true that, as in the case of all human records, there may be errors in the reckonings connected with the record of the meter and the entry of the bill. The small number of errors of this kind discovered during the year, part by the Company itself after the bill had gone out, and part by the consumer, is at once evidence of the general accuracy of the system and of the freedom of the Company from belief in the infallibility of any part of its system. The number of bills presented during the year has exceeded 80,000. Complaint has been made in 1,085 cases, of which 1,052 were that bills were excessive, 8 that bills were below the consumption, and 25 against the minimum charge provided for in our contracts where current is not consumed. The number of errors discovered after careful investigations was in all 33, or one error to 33 complaints, or to 2,450 bills.

Relations with Employes.

The Company has continued to enjoy the same satisfactory relations with its employes as hitherto; a benefit dividend has been paid, as in recent years, in the week preceding Christmas, to all employes in continuous good standing in the service of the Company, at the rate of 3% on the annual salary or wages to those in the employ of the Company for five years continuously, 2% to those of three years' service and 1% to those of one year's service. It is believed that this expenditure is fully justified by the evidence which it affords to the men of the interest of the Company in them and by their careful economy in recognition of this interest. As this amount is an addition to wages, it is proposed, with the approval of the Directors, to constitute this a charge upon the profits rather than as hitherto a wages charge.

High-tension Companies.

During 1895, the Manhattan and Harlem Companies, which are operated under the supervision of this Company, have shown increasingly satisfactory returns, although rather through

lowered operating expenses, the result of efficient station management, than because of actual increase of gross returns. During the spring, the purchase of the securities of the Madison Square Light Company, a corporation which was the result of a re-organization by the Receiver of the local Thomson-Houston Electric Light Co.—originally known as the East River Electric Light Co.—brought the administration of that Company's operations also under the supervision of this Company. The General Manager of the Manhattan and Harlem Companies, Mr. E. A. Leslie, also took charge of the station and system of the Madison Square Company and made at once a number of changes in the direction of increased safety, better service and more economical operation. The results have been fairly satisfactory, and this Company has now under its control an extended high-tension service supplementing its low-tension system in a portion of its territory and extending its operations in the extreme east and north of the city which its low-tension service does not reach. During the coming year it is expected to make such reorganization of the systems of these three Companies as will give the practical benefits of a consolidated service with advantage both to the consumers of high-tension current and to the interests of this Company.

Conclusion.

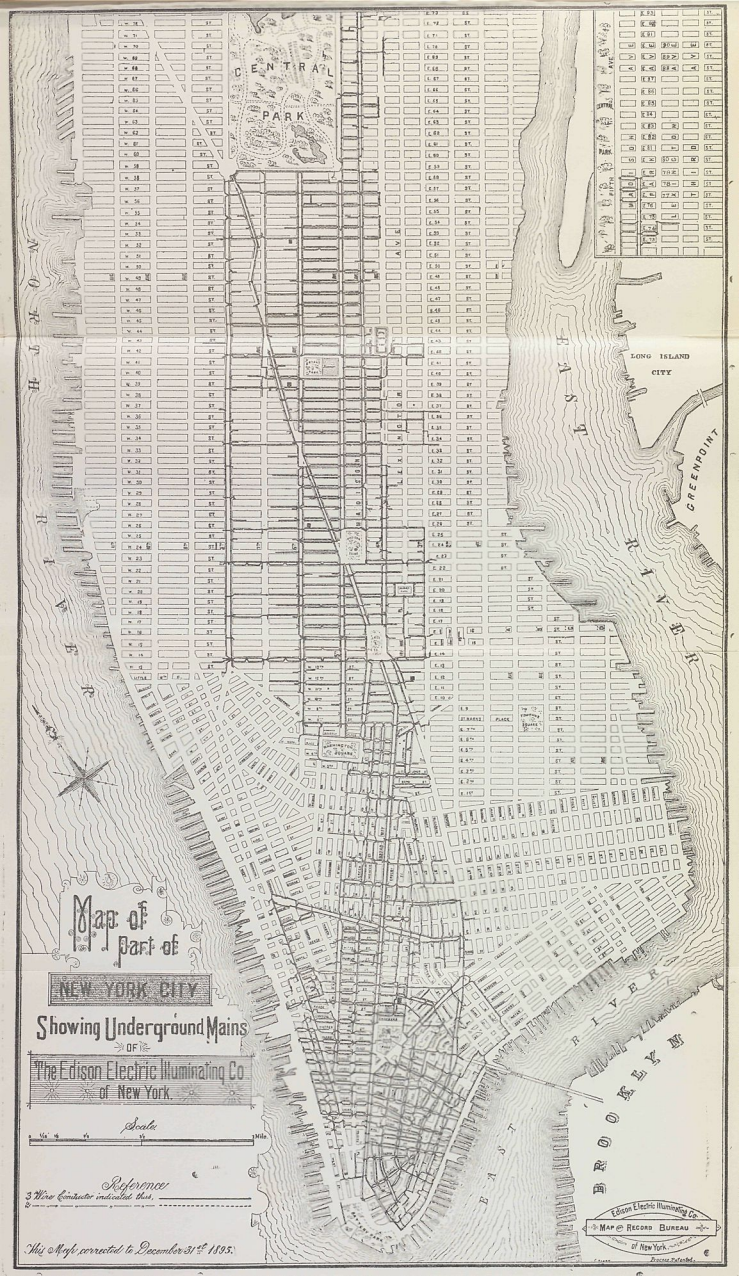
In the latter part of the year, a vacancy occurring in the office of Auditor, Mr. H. M. Edwards, hitherto Secretary and Auditor of the Manhattan Company, was appointed to that position, in which he has already given valuable service. Under his supervision the Company has made considerable improvement in its collection system, obtaining increased promptness of payment with decreased cost of collection, and I take this opportunity to express the great satisfaction which there is reason to feel in his work. The other Staff Officers, corporate and technical, have been making the same good record as heretofore during the year, so that it is unnecessary to single out any one for praise.

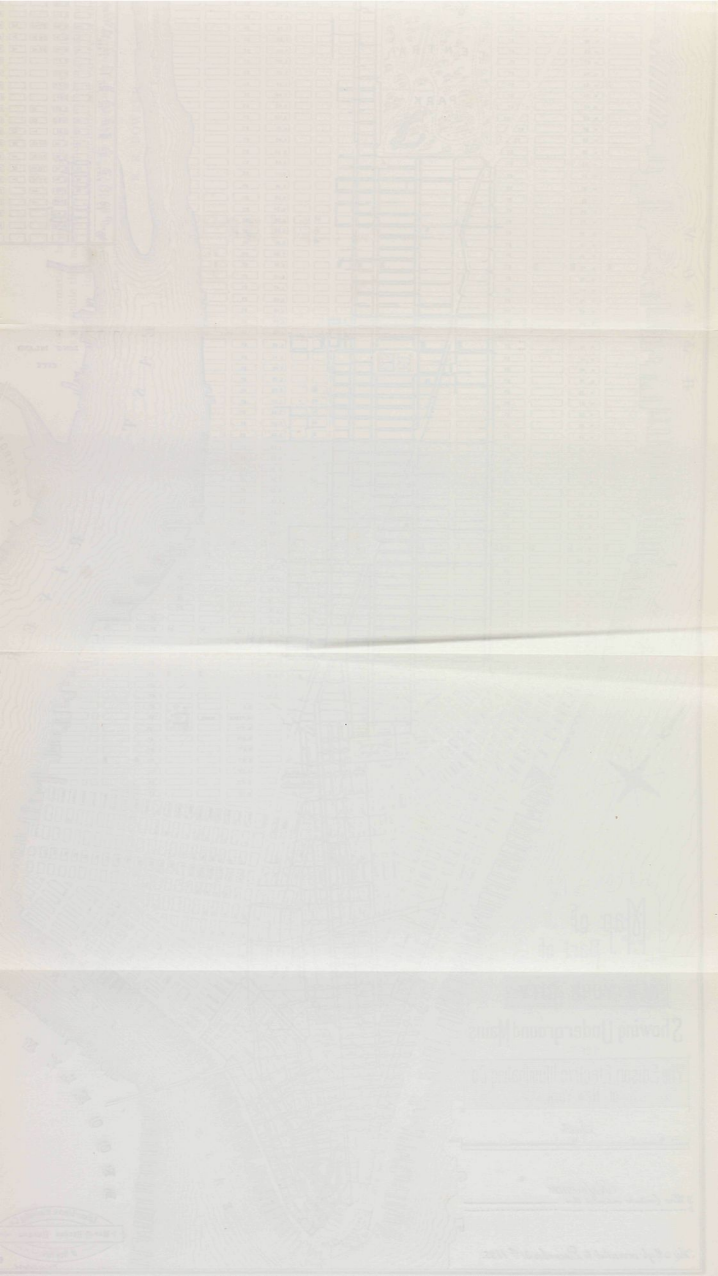
An interesting statement from the engineering point of view of the Company's plant and operations is given with many illustrations in the "Electrical Engineer" for January 8th, 1896, and a reprint of that article will be mailed to each stockholder

for information beyond the scope of an annual report. It is probable that many of our stockholders will be agreeably surprised by its evidence of the magnitude and variety of the Company's operations and of the remarkable solidity and economy of its plant.

R. R. BOWKER,

First Vice-President.


CENTRAL PARK
HUDSON RIVER
EAST RIVER
LONG ISLAND CITY
GREENPOINT
BROOKLYN
EAST RIVER
Map of Part of
NEW YORK CITY
Showing Underground Mains
OF
The Edison Electric Illuminating Co
of New York.
Scale
Reference
3 Wire Conductor indicated thus,
This Map corrected to December 31st 1895.
Edison Electric Illuminating Co.
Map & Record Bureau
of New York.



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ANNUAL REPORT

— OF THE —

BOARD OF DIRECTORS TO THE STOCKHOLDERS,

AT THEIR ANNUAL MEETING,

February 9, 1897.

The Edison Electric Illuminating Co. of New York.

Board of Directors—1896.

A. A. H. BOISSEVAIN,
R. R. BOWKER,
C. H. COSTER,
CHARLES E. CROWELL,
R. FULTON CUTTING,
THOMAS A. EDISON,
W. E. GLYN,
ARTHUR CURTISS JAMES,
D. O. MILLS,
GEO. FOSTER PEABODY,
W. A. READ,
F. S. SMITHERS,
SPENCER TRASK.

Officers.

SPENCER TRASK, - - - - - *President.*
R. R. BOWKER, - - - - *First Vice-President.*
GEO. FOSTER PEABODY, - - - *Second Vice-President.*
FRANK ENOS, - - - - - - *Secretary.*
JOS. WILLIAMS, - - - *Treasurer and Ass't Sec'y.*
H. M. EDWARDS, - - - - - - *Auditor.*

GENERAL OFFICE.

53, 55 AND 57 DUANE STREET.

STATIONS.

53–55–57–DUANE ST.,
115–117–119 EAST 12TH ST.,
47–49–51 WEST 26TH ST.,
117–119 WEST 39TH ST.,
118–120–122 WEST 53D ST.,
BOWLING GREEN ANNEX.

NEW YORK, Jan. 21, 1897.

To the Shareholders of

THE EDISON ELECTRIC ILLUMINATING COMPANY OF NEW YORK.

In presenting the figures for the past year, your Directors have to note a continued increase in the business and prosperity of your Company.

During the year, the high tension companies whose stock and securities, with the sole exception of $32,000 Manhattan bonds, have now been acquired by your Company, their cost being included within its capitalization, have been brought into close working relation with your Company, and the combined results are therefore given for the year ending December 31st, 1896, in comparison with like figures for the previous year, as closely as they can be arranged for comparison :

	1896.	1895.
Gross Station earnings,	$2,222,737.06	$2,000,855.93
General and technical expense, including taxes,	311,838.77	1,115,654.28
Station operating expense,	840,850.21	
Depreciation charges,	127,830.00	100,000.00
Total expenses,	1,280,518.98	1,215,654.28
Net Station earnings,	942,218.08	785,201.65
Earnings from other sources,	24,162.05	30,557.09
Total net income,	$966,380.13	$815,758.74

Deducting from $966,380.13, the amount of interest paid on auxiliary companies' bonds held outside the Edison Company, $2,800, and accounts of these companies written off, $3,423.19, the net income available for your Company is $960,156.94.

The figures for the Edison system alone are appended, for comparison with the figures given in last year's report :

	1896.	1895.
Gross Station earnings,	$1,771,229.82	$1,544,822.78
General and technical expense, including taxes,	253,758.65	218,421.44
Station operating expenses,	582,638.12	541,051.27
Depreciation charges,	120,000.00	100,000.00
Total expenses,	956,396.77	859,472.71
Net Station earnings,	814,833 05	685,350.07
Earnings from other sources,	18,741.89	18,955.46
Income from high tension system,	126,582.00	111.453.21
Total net income,	960,156.94	815,758.74

The interest on Edison bonds in 1896 was $322,100.00, the Edison dividends $476,220.00, a total of $798.320.00.

The combined station earnings show an increase in gross of 11% and in net of 18%. The ratio of operating expenses, including both station and general expenses but not depreciation charges, to gross station earnings is 52%, for both systems, as against 55¾% for the previous year.

The net earnings, it should be noted, are shown less depreciation charges, which during 1896 have been charged off month by month, instead of deducting them at the end of the year in profit and loss account—a conservative course which it is believed will have your approval.

The following are the installations on the combined systems, central station service only, using the rating of arc lamps and motors adopted last year by the leading Edison companies for calculating the 16 c. p. equivalent, *i. e.*, 10 per standard arc lamp and 15 per horse-power:

	1896. Dec. 31.	1895. [Jan. 1, 1896.]	Increase.
No. customers	7,898	6.928	970
No. inc. lamps	309,369	246,628	62,741
No. arc lights	5.559	5.031	528
No. motors, h. p.	15,953	11,658	4,295
Total equiv. 16 c. p.	613,991	483,605	130,386

Adding supplementary service, or emergency connections with isolated plants, the installation figures on Edison and auxiliary services combined, reach a total of 708,458 16 c. p. lamp equivalent.

The concentration in the larger stations and the increased operating economies, conjoined with the large extension of business in the past year, have resulted in a considerable decrease in the cost of current. Your Directors are giving careful consideration to a revision of the Company's prices which by reducing the cost of current to the consumer, wherever practicable, will encourage further increase of the Company's business.

Through the summer, both the 12th street and 39th street stations have been kept out of service as generating stations, being used only as distributing centres. Progress has been made, by the development of storage battery annexes and by the tie feeder system between stations, with the controllable disconnective boxes, toward concentrating operations during the night and over Sunday in one station, and on several occasions the entire system has been operated from the 26th street station exclusively. The technical staff are now making a careful study of the application of this method to produce the most economical results. The new 12th street station, completed in 1895, has been otherwise in continuous service during the year.

The storage battery annex in the Bowling Green Building, replacing the generating plant in the Produce Exchange Building, was completed during the past year and has been in regular service since November 18th. This has usefully supplemented the supply of current during the hours of maximum demand from the Duane street generating plant, which during the hours of minimum demand furnishes the current for charging this storage battery. The storage battery at 12th street has been in service during the year, being charged at minimum hours from either Duane street or 26th street station.

An annex station, transforming current supplied from the Manhattan Company's high tension plant, where there has been surplus power, into direct low tension current, through motor generators, has been installed during the year on a site temporarily leased in the northeast portion of your Company's territory. The results of this experimental installation have been satisfactory and may have an important bearing on the Company's future development. Provisions were of course made against any electrical connection between the high tension and low tension service. The current supplied from this annex has strengthened the service in that important

part of the city, besides demonstrating the feasability of developing this kind of supply on a larger scale.

No important extensions to the underground system have been made during 1896, your Directors considering that during the financial uncertainties of the past year, conservative management was particularly desirable. The mains have been extended, however, to meet the specific requirements of business and the feeders extended in like manner in districts where the demand for current was in excess of the supply.

At the desire of the city authorities, your Company has extended its proposals for city lighting, confining its bids, however, to streets in which Edison mains are already laid. The Fifth avenue system of lighting will be extended to other main thoroughfares and the development of the enclosed arc lamp has made it practicable for the Company to offer to the city a less costly form of lighting, which has been adopted for other streets. Your Company has pursued the policy of making a price for city lighting below the average cost of current, recognizing both that the city is entitled to the best possible rates from a corporation which enjoys the privileges of the streets, and that the long hour demand of city lighting comes in part during the hours in which there is otherwise small demand upon station equipment.

The high tension properties owned by your Company have been effectively reorganized during the past year, and these changes have made possible an increase in operating economies and an improvement in service from the high tension system. These properties are now on a sound business basis which promises satisfactory return on your investments in them

The Balance Sheet and Statement of Income Account are appended. As stated, the depreciation charges during the past year have been carried into monthly expenses before providing for the dividend, which has been continued at the rate of 6% per annum during the year past.

Your Directors during the past year have adopted a method of appropriation from the yearly net earnings to the employees' benefit account, which recognizes the services rendered by the Company's forces in direct proportion with the improvement in operating economies and the increase of net revenue.

During the year, Mr. J. W. Lieb, Jr., has been appointed to the post of General Manager, a promotion to which his long experience and his valuable services to the Company, especially since his return to its staff, have fully entitled him.

Your Directors report with sorrow the loss during the year of Mr. Harrison J. Smith, General Operating Superintendent, who died on June 18th as the result of a fall while at his home. Mr. Smith had been associated with the Company almost from the beginning of its corporate existence, first as a working mechanic, and his career has furnished a useful inspiration to all the men who served under him.

Attention is called to the report of the First Vice-President presented herewith.

By order of the Board of Directors.

SPENCER TRASK,

President.

THE EDISON ELECTRIC ILLUMINATING COMPANY

OF NEW YORK.

DR. CONDENSED BALANCE SHEET DECEMBER 31ST, 1896. CR.

License under Edison Patents		$ 3,159,000 00	Capital Stock	$10,000,000 00	
Real Estate, Construction, Property and other Investment Accounts	$10,227,712 18		Less Treasury Stock	2,062,000 00	$7,938,000 00
12,164 shares Edison L. & P. Installation Co	1,216,400 00		First Mortgage Conv. Gold Bonds	$5,000,000 00	
		11,444,112 18	Less Bonds Converted	688,000 00	4,312,000 00
Customers' Accounts and Bills Receivable		189,703 54	First Consol'd Mortgage Gold Bonds		2,130,000 00
Sundry Accounts and Supplies on hand		111,234 77	Accounts Payable		104,892 48
Cash on hand		170,905 40	Dividend No. 47 (due Feb'y 1, '97)		119,055 00
			License Suspense Account		62,000 00
			Accrued Interest Account		71,866 68
			Insurance Reserve Fund		24,461 73
			Employes' Benefit Account		6,568 50
			Sundry Accounts		25,773 26
			Depreciation Reserve Fund		88,784 66
			Profit and Loss		191,553 58
		$15,074,955 89			$15,074,955 89

E. & O. E.

NEW YORK, December 31st, 1896.

JOS. WILLIAMS,
Treasurer.

THE EDISON ELECTRIC ILLUMINATING COMPANY

OF NEW YORK.

DR. INCOME ACCOUNT YEAR ENDING DECEMBER 31ST, 1896, CR.

Interest on Bonds		$322,100 00
Dividends:		
May 1st	$119,055 00	
August 1st	119,055 00	
November 1st	119,055 00	
Due February 1st, 1897	119,055 00	
		476,220 00
Accounts written off		16,379 64
Employes' Benefit Account		14,500 00
Balance		191,553 58
		$1,020,753 22

Balance Dec. 31st, 1895	$72,016 61	
Less adjustment of accounts previous year	11,420 33	
		$60,596 28
Net station Earnings	$814,833 05	
Income from High Tension System	126,582 00	
Earnings from other sources	18,741 89	
Total Net Income		$960,156 94
		$1,020,753 22

E. & O. E.

NEW YORK, December 31st, 1896.

JOS. WILLIAMS,
Treasurer.

Depreciation charges ($120,000) during 1896 were deducted as a monthly charge against Earnings instead of being treated in Profit and Loss, as in 1895.

First Vice-President's Report.

New York, January 21, 1897.

Spencer Trask, Esq., President

THE EDISON ELECTRIC ILLUMINATING COMPANY OF NEW YORK.

Sir :

The year 1896 has continued the good record of this Company for successful and profitable results. The increase in installations has been unusual, reaching 125,000 16 c. p. equivalent, or 28 per cent., largely in power business, this increment alone exceeding the total installation of any other electric supply Company in this city. This development of business has been for the most part within the Company's lines as existing at the beginning of the year, few extensions of the underground system having been made except within the territory previously occupied and then only to meet the demands of customers at a short distance from the mains. The new developments in the electrical industry emphasize more and more the permanent value of the Company's distributing system, and the improved methods of gas-burning have made no perceptible inroads on its business. The gross station returns have increased 14⅔ per cent., while the general and operating expenses have increased but 7½ per cent.

The following table shows the net increase in the several classes of installation and in earnings in the past year, reckoning a standard arc lamp as the equivalent of ten 16 c. p. incandescent lamps and a horse-power in motors as the equivalent of fifteen 16 c. p. incandescent lamps, the basis agreed upon last year by the leading Edison companies for reckoning such equivalents, as stated in last year's report :

	1896. Dec. 31.	1895. (Jan. 1, 1896.)	Increase in 1 year.	Per ct. Inc.
No. customers	6,562	5,705	857	15
No. inc. lamps	279,405	218,877	60,528	27
No. arc lights	3,225	2,964	261	8
No. motors, h. p.	15,930	11,640	4,290	36
Total equiv. 16 c. p.	560,342	434,834	125,508	28
Gross station returns †	$1,771,229.83	$1,544,822 78	$226,407.05	14⅔
Gen. and oper. expenses *	836,396.77	759,472.71	56,924.06	7½
Net station returns †	934,833.02	785,350.07	149,482.99	19
Prop. expense * to gross †	47%	50%		

* Exclusive of depreciation charges. † Not including outside earnings.

These figures include only Edison central station direct service.

The following table gives the figures inclusive both of Edison central station service and of isolated plant installations supplied from the Edison stations during minimum hours or for emergencies.

	Central Station Service.	Isolated Plant Service.	Total Service.
Customers	6,562	72	6,634
Meters	8,441	91	8,532
Incandescent lamps	279,405	64,705	344,110
Inc. lamps, 16 c. p. equiv.	286,532	68,447	354,979
Arc lamps, number	3,225	889	4,114
Arc lamps, 8 ampere eqv.	3,486	889	4,375
Motors, h. p.*	15,930	1,142	17,072
Total Equivalent	560,342	94,467	654,809

* NOTE.—Miscellaneous equipments, such as heaters, organ control, physicians' apparatus, etc., are included in h. p.

These figures do not include those of the high-tension companies operated under the supervision of this Company and constituting practically the high-tension division of this Company. These companies had on their station service December 31, 1896, 29,964 incandescent and 2,334 arc lights, and 23 horsepower in motors, or an equivalent of 53,649, which, added to the Edison station service, gives a total of 613,991, or, with isolated plant service, 708,458 16 c. p equivalent.

The following table shows the returns from current for each district (I. down-town, II. up-town) for each month, not including the Company's general office expenses, taxes, or depreciation charges, or its outside sources of revenue :

1896	FIRST DISTRICT.			SECOND DISTRICT.		
Month.	Station Gross Returns.	Operating Expenses.	Station Net Returns.	Station Gross Returns.	Operating Expenses.	Station Net Returns.
Jan ...	$80.965.50	$21,610.79	$59.354 71	$96,266.74	$33.374.69	$62,892.05
Feb ..	76.714.63	19,034.50	57,680.13	83,554.91	28,931.14	54,623.77
March	70,564.21	19,489.10	51,075.11	77,475.95	29,708.50	47,767.45
April .	68,394.50	17,780.36	50,614.14	76,259.01	27,201.21	49,057 80
May ..	63,026.53	19,183.86	43,842.67	67,703.61	26,204.01	41,499.60
June..	63,611.95	19,313.41	44,298.54	58,402 37	25,570.64	32,831.73
July ..	66,278.05	19,369.41	46,908.64	52,306.75	24,257.68	28.049.07
Aug ..	66,723.19	18,387.81	48.335.38	50,545.94	26.394.32	24,151.62
Sep...	67,424.01	18,541.85	48,882.16	56,766.37	26,645.88	30,120.49
Oct...	78,173.23	19,223.66	58,949.57	72,997.28	33,028.16	39,969.12
Nov ..	87,364.36	18,394.01	68.970.35	93,516.95	32,592 79	60.924.16
Dec ..	92,883.34	21,102.32	71,781.02	103,310.44	37,298.02	66,012.42
	$882,123.50	$231,431.08	$650,692.42	$889,106.32	$351,207.04	$537,899.28

The gross returns are, as usual, strikingly close in the two districts, being this year slightly greater uptown than downtown, the reverse of last year's results. The downtown district had, December 31, 1896, on the new survey, 3,740 customers, using 93,316 incandescent lamps, 1,588 arc lamps and 10,703 h. p. in motors, supplied through 88.08 miles of feeders and mains. The uptown district had 2,822 customers, using 186,089 incandescent lamps, 1,637 arc lamps and 5,227 h. p. in motors, supplied through 121.25 miles of feeders and mains. The station gross earnings show as usual more steadiness from month to month in the downtown district, the gross returns in December being less than 50 per cent. above those in May, than in the uptown district, where the gross returns in December are more than double those in August. The difference is accounted for in part by the steadiness of industrial use of power in the downtown district.

Bowling Green Storage Battery Annex.

The generating plant in that portion of the Produce Exchange Building rented from the Produce Exchange as an annex station, was entirely removed in the month of April, and in its place provision was made for a storage battery Annex in the new Bowling Green Building, so near as to permit the utilization, by running feeders across Broadway, of the existing distributing centre adjoining the Produce Exchange. By arrangement with

the proprietors of the Bowling Green Building, space was obtained in the sub-basement of that building for the installation of a storage battery, supplied by The Electric Storage Battery Company of Philadelphia, of a capacity of 8,000 ampere hours at a ten-hour discharge rate or 4,000 amperes at 125 volts for one hour. A model storage battery plant has been satisfactorily installed here with good operating results, the existing feeders proving adequate for the charge of the battery from the Duane Street Station, and being utilized from both ends for the supply of the lower part of the city during the hours of maximum demand. By careful handling of the charging of the battery, it has been practicable to keep the large units at the Duane Street Station operating at practically full load and with most economical results, during the hours while these are in service.

Station Equipment.

The equipment at the Duane Street Station was not increased during 1896, with the exception of a new B. & W. 365 h. p. boiler. The 250 h. p. McIntosh & Seymour engine and its dynamos were transferred to the 53d Street Station, leaving the total equipment at the Duane Street Station at this date in boilers 4,497 (rated) h. p., engines 9,300 h. p., and dynamos 6,000 k. w.

On the discontinuance of the Produce Exchange Annex, in April, the 250 h. p. McIntosh & Seymour engine and its dynamos were transferred to the 53d street station. The Bowling Green Annex replaces the Produce Exchange Annex, supplementing the Duane street station with its storage battery installation, of a capacity of 8,000 ampere hours at a ten-hour discharge rate, or 4,000 amperes at 125 volts for one hour.

The 12th Street Station equipment consists at present of one 500 h. p. McIntosh & Seymour compound engine, and one 450 h. p. Armington & Sims engine, each engine driving two 175 k. w. Edison dynamos, and one 300 h. p. De Laval steam turbine, driving two 100 k. w. dynamos. In addition, the 12th Street Station is equipped with a storage battery of 8,000 ampere hours capacity at a 10-hour discharge rate, or 4,000 amperes at 125 volts for one hour. A Barnard cooling tower with Wheeler surface condenser of 750 h. p. capacity, provides condensing water for the McIntosh & Seymour engine and the De Laval turbine. The total station equipment at this date is in boilers, 999 (rated)

h. p.; engines, 1,250 h. p., and dynamos and storage battery, 1,170 k. w.

The 26th Street Station attained its full equipment and capacity three years ago, and no extensions have been made since. Its equipment is in boilers, 2,576 (rated) h. p.; engines, 3,800 h. p.; and dynamos, 2,800 k. w.

The equipment at the 39th Street Station has been extended by the addition of a 300 h. p. De Laval steam turbine, driving two 100 k. w. dynamos, making the total 39th street equipment in boilers 1,630 (rated) h. p.; engines, 2,400 h. p., and dynamos, 1,840 k. w.

The 53d Street Station received as additional equipment during the year two 250 h. p. engines, originally installed at the Produce Exchange Annex, and one boiler originally installed at the old Pearl Street Station, making the present equipment in boilers, 1,123 (rated) h. p.; engines 1,400 h. p., and dynamos and storage battery, 1,040 k. w.

An Annex Station, installed on premises temporary leased at 72d street and 5th avenue, is supplied by the Manhattan Company from its main station at the foot of 80th street, with high tension two-phase alternating current, operating a 240 k. w. two-phase motor at 2,000 volts. This drives two 100 k. w. 135 volt Edison direct current dynamos, furnishing low tension current which re-inforces the supply in the upper district, pending the further development of the 53d Street Station system.

Operating Results

The down-town district, including the Duane Street Station and the Bowling Green Annex, reached in 1896 a maximum load of 37,250 amperes, December 15th, the equivalent of nearly 88,000 16 c. p. lamps lighted at one time. The maximum current supplied by this district in 1895 was 31,550 amperes; in 1894, 27,500 amperes; in 1893, 24,400 amperes; in 1892, 21,000 amperes; and in 1891, 13,550 amperes. The best daily average of the year was 13,230 amperes, November 11th. The best average in 1895 was 10,769 amperes; in 1894, 9,961 amperes; in 1893, 8,829 amperes; in 1892, 7,906 amperes; and in 1891, 5,200 amperes.

The up-town district, including the 26th Street Station, and the 12th, 39th, 53rd Street and Manhattan Annex Stations, run

as annexes, reached duriug the year a maximum load of 42,590 amperes, December 23rd, the equivalent of over 100,000 16 c. p. lamps. The maximum load of this district in 1895 was 37,820 amperes ; in 1894, 33,200 amperes ; in 1893, 27,330 amperes ; in 1892, 20,320 amperes ; and in 1891, 14,300 amperes. The best daily average of the year was 16,433 amperes, December 23rd. The best daily average in 1895 was 14,973 amperes ; in 1894, 12,598 amperes ; in 1893, 10,673 amperes ; in 1892, 7,473 amperes ; and in 1891, 7,300 amperes.

At the several stations the maximum load of the year was reached at the Duane Street Station, December 4th, with 35,750 amperes ; at the Bowling Green Storage Battery, December 3rd, with 2,800 amperes ; at the 12th Street Station, December 21st, with 7,990 amperes ; at the 26th Street Station, December 15th, with 21,900 amperes ; at the 39th Street Station, December 28th, with 10,400 amperes ; and at the 53d Street Station, December 3rd, with 6,975 amperes ; and at the Manhattan Annex, December 25th, with 1,550 amperes.

The highest load of the entire system taken together was on December 15th, a maximum of 79,360 amperes. The best daily average of the system was on December 22nd, 28,926 amperes.

The total current generated in the year was in the down-town district, 68,738,565 ampere hours, and in the up-town district 84,581,417 ampere hours ; in both districts a total of 153,319,982 ampere hours.

The modern equipment of 12th Street Station, including the storage battery, the turbo-generator and the water cooling tower, has shown most interesting and on the whole satisfactory results, although there have been some drawbacks in the handling of all these new classes of appliances, as is usually the case in pioneer work. By help of the storage battery at 12th Street, the generating plant of the entire system, with the exception of that of the 26th Street Station, was shut down on several occasions over night or over Sunday, for the purpose of testing the practicability of running the entire system from one generating plant during the hours of mininum load. The results show that this is quite practicable, and with the aid of the new storage battery in the Bowling Green Annex, it is probable that considerable improvements in economy will de developed in this way during the coming year.

Underground Installation.

The mileage of the underground street system December 31, 1895, was, on the 3-wire system, 68.76 miles of feeders and 133.92 miles of mains, a total of 202.68 miles of the 3-wire system; and on the 2-wire system, 0.24 mile of mains. The total mileage December 31, 1895, including 1.41 miles of cable feeders contiguous to the stations, was 202.92 miles of mains and feeders. The system also included December 31, 1895, 1,160 junction boxes at intersections.

During the year 1896, in the down-town district, 0 81 mile of 3-wire feeders have been laid, and 0.29 removed, an increase of 0.52; and 2.72 miles of mains have been laid, and 0.34 mile removed, making an increase of 2.38 miles. Of the old 2-wire system in the down-town district 0.07 mile of mains has been removed. This leaves but 0.17 mile of mains of the old 2-wire system. The net increase in the first district is 2.83 miles.

In the up-town district 1.95 miles of feeders have been laid and 0.56 removed and 2.91 miles of mains laid and 0.72 removed, making an increase of feeders of 1.39 miles and in mains of 2.19 miles, a total increase of 3.58 miles, all 3-wire, in the second district. The removal of feeders and mains up-town was chiefly due to replacement with larger conductors of the small tubing used in some streets when the up-town system was first laid.

The net increase of the system, in both districts, is 6.41 miles, bringing the grand total December 31, 1896, to 209.33 miles. The increase in junction boxes has been 48, making a total of 1,208.

The number of service connections added during the year was (net) 317 in the down-town district, and 402 in the up-town district; in both 719.

Inspection Department.

The Inspection Department has been most successful in its work of the year, combining as hitherto the functions of the general agency and of general inspection, increasing the business of the Company and at the same time improving the standard of insulation and of installation generally. During the year 230 contractors have reported installations, involving 2,840 reports. Of these, 13 have reported installations reaching over 1,000

incandescent lamps in the year past, being in order of lamps installed: New York Electric Equipment Company, A. Noll, Zimdars & Hunt, Randolph & Sullinger, J. P. Hall, Alexander-Chamberlain Electric Co., Hatzel & Buehler, Conduit Wiring Co., Western Electric Co., Buschman & Starratt, Tucker Electric Construction Co., Globe Electric Construction Co., and C. L. Eidlitz. In addition to these contractors, who have also installed arc lamps and motors in large numbers, J. L. Chapin is entitled to mention for his large installation of motors. Of electric motors, in which the exceptional development of 1895 has continued throughout 1896, 47 types have been installed on the system, numbering 1,319 motors, averaging 3.47 h p. each and aggregating 4,290 h. p. The use of electric elevators continues to increase.

Meter Bureau.

The Meter Bureau, under the general charge of the Controller, has been very efficient during the year; it had under its care on Decembes 31, 1896, 8,532 meters in customers' premises, of which the great number were Edison chemical meters. The most careful attention has been given to complaints from customers, as to amount of bills, etc., of which 1,359 were received during the year. In connection with these complaints, 86 errors were found, of which 63 were clerical and 23 technical, 14 of these last because of the freezing of meter bottles during extremely cold weather. The proportion of errors to bills rendered was but 1 in 1,107, or less than 1/10 of 1 per cent. The policy of offering to submit any disputed case to arbiters has been continued with satisfactory results.

Relations with Employes.

During the year past, the benefit-dividend paid to employes, has been placed on a more definite basis, so that the employes more directly reap the advantage of the bettered economies and increased revenues which they help to bring about. After deducting from the gross earnings a sum covering operating and general expenses, depreciation charges, and a minimum return on capital, a percentage on the balance equal to the rate of dividend paid to stockholders has been appropriated for the employes benefit fund. From this, there has been paid, in the week preceding Christmas, to all employes in continuous good standing

in the service of the Company, 4 per cent. on the annual salary or wages to those in the employ of the Company for 10 years, 3 per cent. to those of 5 years' service, 2 per cent. to those of 3 years' service and 1 per cent. to those of one year's service. There are many evidences that this form of profit-sharing is thoroughly appreciated by the employes and it is believed that the effect is to obtain the most hearty co-operation of all in bettering the efficiency of the Company's service.

Electrical Developments.

During the spring an Electrical Exposition was held in New York under the auspices of the National Electric Light Association, to which this Company gave cordial support and in which it took a leading part. The exhibit of this Company, which formed so distinctive a feature of the Exposition, illustrated most fully the extraordinary range of application of the Edison low tension current, and was a surprise to most of the citizens of New York, who in large numbers visited that Exposition. The application of the current for heating and cooking purposes attracted special attention, and during the latter part of the year the development of this class of business has received increasing attention from the Company's staff. An electrical kitchen is now in practical operation at the Company's building and can be seen on specified days in the week, on application by letter. The development of apparatus for this purpose is in a more promising state than ever before and its promoters are working in hearty co-operation with this Company. The development of the enclosed arc light, which requires trimming only once a week instead of once a day, is also proving of considerable advantage to this Company and it furnishes a method of lighting large interior spaces which is most economical as well as most effective.

City Lighting.

The lighting of Fifth avenue on the Edison system had given such general satisfaction that last year, at the request of citizens and of the city authorities, this service was extended to a portion of Madison avenue, from 59th street to 72d street, which was not lighted by electricity. This year the insistent requests of the residents of Madison avenue for the extension of that system

south to 23d street, have resulted in an arrangement with the City authorities under which Madison avenue, from 23d to 79th streets, as well as Fifth avenue from its beginning to the same Streets, will be lighted by the Edison-Bowker two-arc system, which will also be extended to some of the wider cross streets. The Commissioner of Public Works, who made during the early winter a visit of inspection abroad, reported on his return that "no street lighting in Paris or London excels the Edison lamps on Fifth and Madison avenues for beauty or illumination." This form of lighting is, however, somewhat more costly than other electric lighting throughout the city and, in co-operation with the city authorities, a system of single lamps for street service will be installed in other streets where there are Edison mains, to the extent of about 200 additional posts. The price made to the city is below the actual average cost of current to the Company, but the hours of burning are unusually long, giving employment for the station equipment during hours when there is little demand upon it, and this fact, conjoined with a recognition of the fact that the city should enjoy the benefit of the best possible rates from a corporation making use of the public streets, has justified a price very much below that necessarily charged for commercial lighting.

Conclusion.

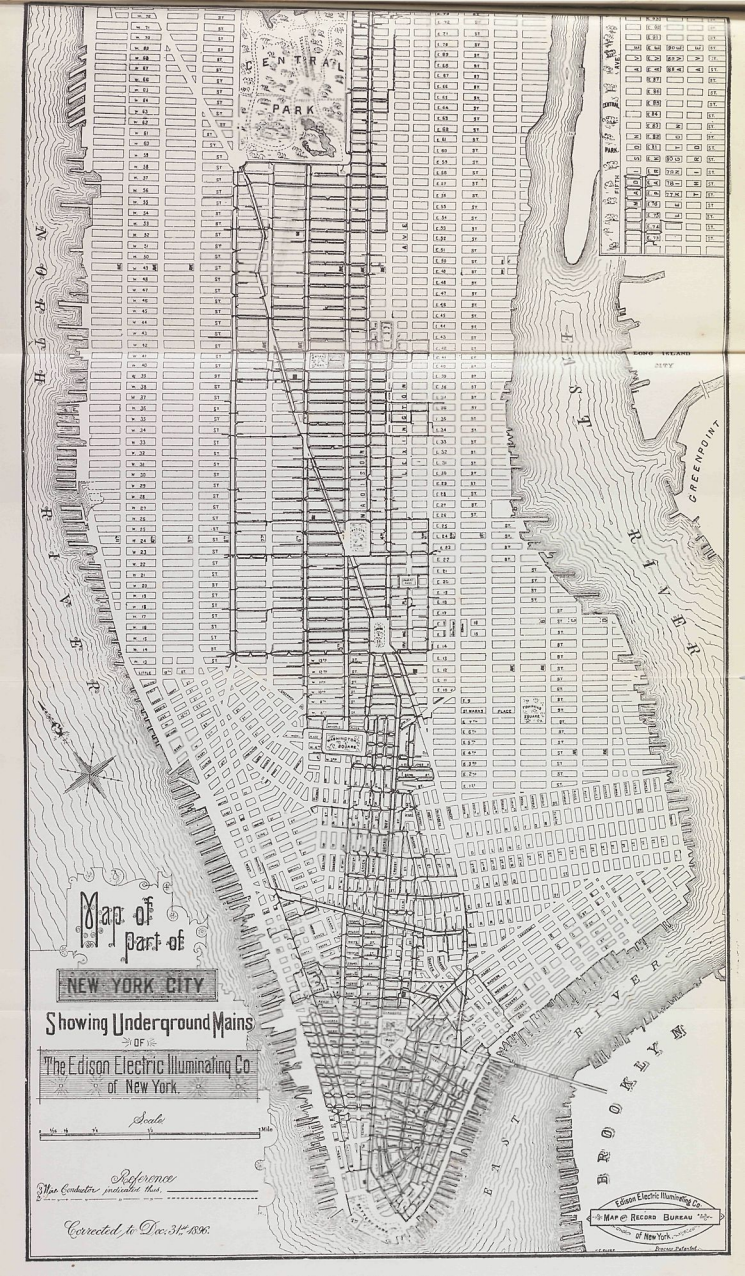
During the past year the Company has suffered its first severe loss by death in the ranks of its staff. Mr. Harrison J. Smith, who died June 18, 1896, from the effects of a fall while at his home, had entered the service of the Company in 1881 as a working mechanic, and had been almost steadily in its employ from that date to the day of his death. He had won his promotion to the important and responsible position of General Operating Superintendent by keen self-education and persistent personal development, which made him of increasing value to this Company. His pluck in facing emergencies and his coolness under any circumstances always inspired the men under him with corresponding qualities, and his practical qualities supplemented in the most admirable way the technical knowledge and training of other members of the Company's staff. The sorrow at his death, throughout the operating department and in other divisions of the Company with which he was less closely connected, gave

evidence of the thorough way in which the interests of the Company and its employes are now knit together. The staff of the Company are joining in providing for a suitable memorial for Mr. Smith, toward which the Company is also contributing.

Previous to Mr. Smith's death, it had been proposed to promote Mr. J. W. Lieb, Jr., Assistant General Manager, to the post of General Manager—a promotion which he had fully earned. Mr. Lieb was the first on the pay rolls of the Company at the old Pearl Street Station, leaving its service for the work in Milan, Italy, which occupied him until his return to the service of the Company in 1894, and his wide experience and technical training have made him a most valuable officer of the Company, not only co-operating with Mr. John Van Vleck, the Constructing Engineer, in the engineering development of the Company, but keeping a careful oversight also of the operating department. This department had been so thoroughly organized before Mr. Smith's death, with capable superintendents in charge of each of the two districts, that it did not seem necessary to continue the office of General Operating Superintendent.

The decrease of operating expenses and the extension of the Company's business have made it possible to consider a further reduction of the Company's prices for current, and careful attention has been given to this matter during the latter part of the year in the hope of revising the schedule to the satisfaction of our customers and the public the early part of the new year.

R. R. BOWKER,
First Vice-President.


CENTRAL PARK
NORTH RIVER
EAST RIVER
LONG ISLAND CITY
GREENPOINT
BROOKLYN
Map of Part of
NEW YORK CITY
Showing Underground Mains
OF
The Edison Electric Illuminating Co of New York.
Scale
Reference
Map Corrected to Dec. 31st 1896.
Edison Electric Illuminating Co
MAP & RECORD BUREAU
of New York

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ANNUAL REPORT

OF THE

BOARD OF DIRECTORS TO THE STOCKHOLDERS,

AT THEIR ANNUAL MEETING,

February 8, 1898.

The Edison Electric Illuminating Co. of New York.

731

Board of Directors—1897.

A. A. H. BOISSEVAIN,
R. R. BOWKER,
C. H. COSTER,
CHARLES E. CROWELL,
R. FULTON CUTTING,
THOMAS A. EDISON,
W. E. GLYN,
ARTHUR CURTISS JAMES,
D. O. MILLS,
GEO. FOSTER PEABODY,
W. A. READ,
F. S. SMITHERS,
SPENCER TRASK.

Officers.

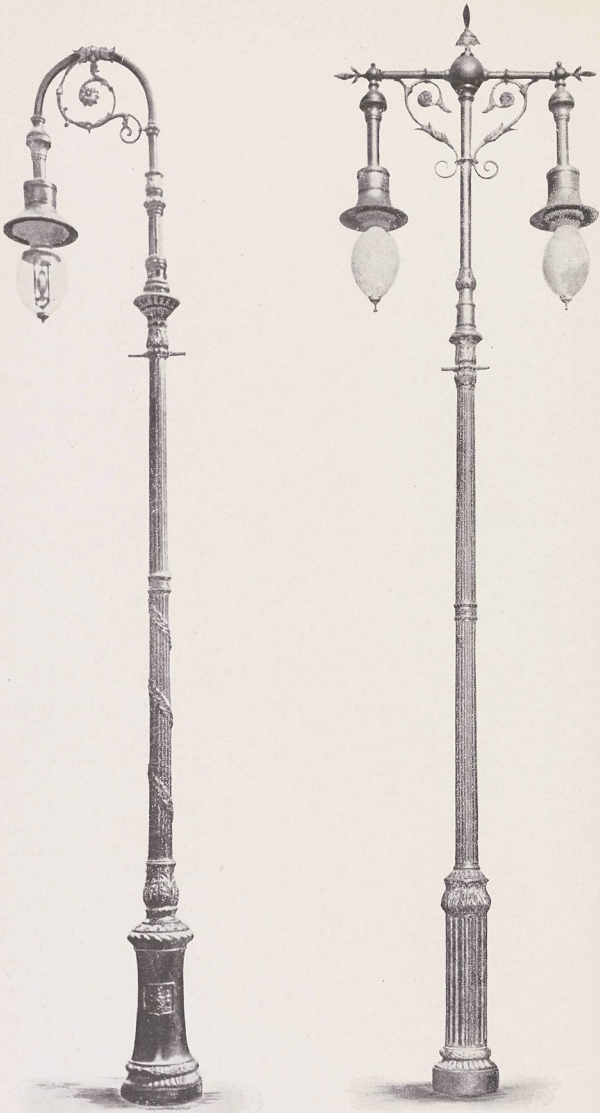
SPENCER TRASK, - - - - - *President.*
R. R BOWKER, - - - - - *First Vice-President.*
GEO. FOSTER PEABODY, - - - *Second Vice-President.*
FRANK ENOS, - - - - - - *Secretary.*
JOS. WILLIAMS, - - - *Treasurer and Ass't Sec'y.*
H. M. EDWARDS, - - - - - *Auditor.*

GENERAL OFFICE.

53, 55 AND 57 DUANE STREET.

STATIONS.

53-55-57 DUANE ST.,
115-117-119 EAST 12TH ST.,
47-49-51 WEST 26TH ST.,
117-119 WEST 39TH ST.,
118-120-122 WEST 53D ST.,
BOWLING GREEN ANNEX.



EDISON LAMP POSTS.

NEW YORK, Jan. 20, 1898.

To the Shareholders of

THE EDISON ELECTRIC ILLUMINATING CO. OF NEW YORK.

The business of your Company during the year that has passed, has continued to show a steady increase, with gratifying financial results, as will appear from the following:

	1897.	1896.
Gross Station earnings,	$2,466,255.71	$2,222,737.06
General and technical expense, including taxes,	349,916.21	311,838.77
Station operating expense,	875,222.64	840,850 21
Depreciation charges,	144,000.00	127,830.00
Total expenses,	1,369,138.85	1,280,518.98
Net Station earnings,	1,097,116.86	942,218.08
Earnings from other sources,	20,380.18	24,162.05
Total net income,	$1,117,497.04	$966,380.13

The interest on bonds in 1897 was $324,950.00, the dividends $476,224.50, a total of $801,174.50.

The station earnings show an increase in gross of 11% and in net of 16%. The ratio of operating expenses, including both station and general expenses but not depreciation charges, to gross station earnings, is 49½%, as against 52% for the previous year.

The net earnings, it should be noted, are shown less the depreciation charges which have been charged off month by month.

The following are the installations, central station service only, using the rating of arc lamps and motors adopted by the leading Edison companies for calculating the 16 c. p. equivalent, *i. e.*, 10 per standard arc lamp and 15 per horse-power;

	1897. Dec. 31.	1896. Dec. 31.	Increase.
No. customers, . . .	8,711	7,898	813
No. inc. lamps, . .	382,291	309,369	72,922
No. arc lights, . . .	7,201	5,559	1,642
No. motors, h. p., . .	19,380	15,953	3,427
Total equiv., 16 c. p., . .	756,438	613,991	142,447

Adding supplementary service, or emergency connections with isolated plants, the installation figures on all services combined, reach a total of 837,366 16 c. p. lamp equivalent.

The decrease in the cost of current reported in the previous year has been continued, and in bettering ratio, during the year past. The economy obtained from our engines, non-condensing, has, indeed, been so close as to cause surprise among electrical engineers. During the coming year, it is proposed to increase operating economies further by running the large direct-connected engines as condensing engines, by aid of condensing and water-cooling apparatus to be installed at both the Duane and 26th Street Stations.

From March 1st to October 1st the entire Edison system was operated exclusively from the 26th Street Station during the night and over Sunday, and for the entire summer the operations of the 12th and 39th Street Stations were suspended, in the interest of economical operation.

The operating economies, in connection with the large extension of business, permitted considerable reduction in rates. Your Directors thought it wise to broaden the field of the Company by lowered prices and thus to insure increase in value for the securities rather than to increase the rate of dividend. Accordingly, a wholesale rate for large buildings, based on the electrical unit of the kilowatt hour, was adopted, which has successfully met the competition of isolated plants. Discounts for long-hour average use of lamps have been extended during the latter part of the year to monthly bills of $50 or more, instead of $200 as heretofore, which it is expected will cause many customers who have been using gas and electricity to replace the gas altogether by electricity.

Electricity has the advantage over gas, as an illuminant, that although it cannot be stored cheaply in large quantities, it can

be produced at a very low cost, if the machinery can be kept running outside of the hours of greatest demand. Your Directors have, therefore, authorized a general policy of reducing the prices for light outside maximum hours, as shown by long average use of lamps, to a price much below the standard or maximum prices and below the price of gas. For the supply of current under the same conditions of demand, the Company adheres to the policy of making prices absolutely uniform to all consumers by giving to each customer the benefit of any reduction made to others of his class.

Extensions of the underground system have been confined chiefly to extending the mains within the territory at present occupied by the Company, through streets or to buildings where a demand had shown itself, and to installing new feeders to provide for the increased demand upon the mains. In the coming year, it is proposed to make considerable extensions of the underground system into territory not hitherto occupied by the Company's service.

The adoption of the enclosed arc lamp has greatly stimulated arc lighting on the low-tension system. The number of low-tension arc lights has increased during the year from 3,225 to 4,775. Upon the application of the enclosed arc lamp to city lighting, a post of special and artistic design was devised by the Company's engineers, after studying designs of electric posts in other cities abroad as well as in this country. 285 street lamp posts were installed during the year, and the Company has been asked to place about 300 more for the coming year.

The high tension properties owned by your Company have shown great increase of economy since the consolidation into the system of the installations of the old Madison Square Light Company.

The Balance Sheet and Statement of Income Account are appended. Depreciation charges throughout the year have been carried in the monthly expenses, the dividend has been continued at the rate of six per cent. per annum, and out of the surplus earnings extra allowances have been made for general depreciation account.

The great increase of business during the past two years has been cared for without increase of capital account. New construction, making good replaced or depreciated plant, has been

done largely out of depreciation charges and the improved facilities thus afforded have, in great measure, provided for the large extensions of the business. There has been no floating debt, with the exception of $150,000 borrowed temporarily at the close of the year for construction purposes in advance of the issue of additional securities. To provide for the further extensions of the plant required by the growth of business already assured for the coming year, funds will be raised through security issues.

The strong position which the Company now occupies, and the high rank which all of its securities hold, have led the Directors to believe that the most satisfactory way to provide the necessary amount is to allow the stockholders to obtain the full benefit from this enhanced value, and they will, therefore, shortly offer to the stockholders the privilege of subscribing for $1,200,000 of Treasury stock at par.

Attention is called to the report of the First Vice-President, presented herewith.

By order of the Board of Directors,

SPENCER TRASK,
President.

THE EDISON ELECTRIC ILLUMINATING COMPANY

OF NEW YORK.

DR. CONDENSED BALANCE SHEET DECEMBER 31ST, 1897. CR.

License under Edison patents		$3,159,000 00
Real Estate, Construction, Property and other Investment Accounts	$10,793,518 35	
12,164 shares Edison L. & P. Installation Co.	1,216,400 00	
		12,009,918 35
Insurance Reserve Investment:		
24 Edison 1st Consolidated Bonds		24,000 00
Customers' Accounts and Bills Receivable.		233,291 93
Sundry Accounts and Supplies on hand		112,664 22
Cash on hand		68,032 94
		$15,606,907 44

Capital Stock authorized	$10,000,000 00	
Less Stock not yet issued	2,062,000 00	
		$7,938,000 00
First Mortgage Conv. Gold Bonds	5,000,000 00	
Less Bonds Converted	688,000 00	
		4,312,000 00
First Consolidated Mortgage Gold Bonds		2,187,000 00
Bills and Accounts Payable		260,992 27
Dividend No. 51 (due Feb. 1, 1898)		119,056 50
License Suspense Account		62,000 00
Accrued Interest Account		71,866 68
Insurance Reserve Fund:		
Edison Bonds	24,000 00	
Cash	9,985 46	
		33,985 46
Employes' Benefit Account		18,058 00
Sundry Accounts		61,352 82
General Depreciation Account		488,784 66
Profit and Loss		53,811 05
		$15,606,907 44

NEW YORK, December 31st, 1897.

JOS. WILLIAMS,
Treasurer.

THE EDISON ELECTRIC ILLUMINATING COMPANY

OF NEW YORK.

DR. INCOME ACCOUNT YEAR ENDING DECEMBER 31ST, 1897. CR.

Interest on Bonds		$324,950 00
Dividends:		
May 1st	$119,055 00	
August 1st	119,056 50	
November 1st	119,056 50	
Due February 1st, 1898	119,056 50	
		476,224 50
Customers' and Sundry Accounts Written Off		18,817 16
Interest and Discounts		7,295 28
Employes' Benefit Account		23,607 00
General Depreciation Account		400,000 00
Balance		53,811 05
		$1,304,704 99

Balance Dec. 31st, 1896	$191,553 58	
Less Adjustment of Accounts previous year	4,345 63	
		$187,207 95
Net Station Earnings	$965,838 22	
Income from High Tension System	131,374 74	
Earnings from other sources	20,284 08	
Total Net Income		1,117,497 04
		$1,304,704 99

JOS. WILLIAMS,
Treasurer.

NEW YORK, December 31st, 1897.

NEW YORK, January 31, 1898.

Having examined the books of The Edison Electric Illuminating Company of New York for the year ending December 31st, 1897, we hereby certify that the above Balance Sheet and Income Account are correct and in accordance with the books and in our opinion truly represent the operations and position of the Company at December 31st, 1897.

In the course of our audit we verified the Cash and Bank Balances, examined vouchers and counted the securities owned by the Company, all of which were found correct and in order.

We find the books well kept and all accounts carefully and correctly balanced.

BARROW, WADE, GUTHRIE & CO., *Auditors.*

NEW YORK, January 20, 1898.

Spencer Trask, Esq., President,

THE EDISON ELECTRIC ILLUMINATING COMPANY OF NEW YORK.

SIR:

This Company, which first sold current in 1882, had on Jan. 1, 1890, 1,200 customers and installations of 39,815 incandescent and 77 arc lamps and 421 h. p. in motors, being the equivalent of 46,900 16 c. p. lamps. Its maximum output was 12,000 amperes (estimated); it had $2,850,000 loan and share capital, its gross income for the previous year was $329,773 and its net $124,031 or 38%. After eight years of development, it has now (January 1, 1898) 7,313 Edison customers, and installations of 346,723 incandescent and 4,775 arc lamps and 19,364 h. p. in motors, being the equivalent of 696,370 16 c. p. incandescent lamps, exclusive of 60,068 high-tension and 80,928 breakdown connection, equivalent in all to 837,366 16 c. p. It reached, in 1897, 100,000 amperes maximum output; it has $14,500,000, in round numbers, loan and share capital; its gross income for combined systems was, in 1897 $2,486,636, and its net, without depreciation charges, $1,261,497, or 50.7%, or deducting depreciation charges, $1,117,497, or 45%. The progress in eight years shows six times the number of customers, seventeen times the installation, eight times the maximum output, on but fivefold the capital, withover seven times the gross and nine times the net income. In the eight years no previous year has shown so great an increase as 1897, in which the number of customers has been increased 751, the number of Edison lamps 67,318, the number of arc lights 1,550, the horse-power in motors 3,433, and the installation equivalent 136,028. For the Edison system only the gross station returns have increased 13.7%, and the general and operating expenses have increased 10.9%. It is especially remarkable that this development has taken place with so small an in-

crease in the investment account, the extensions of the system having been confined during the present year to additions to the generating plant requisite to maintain the proper reserve, the extension of the feeder system to points where was indicated increasing demand, and the extension of the mains only to points where that demand was definitely promised.

The following table shows the net increase in the several classes of installation and in earnings in the past year, reckoning a standard arc lamp as the equivalent of ten 16 c. p. incandescent lamps and a horse-power in motors as the equivalent of fifteen 16 c. p. incandescent lamps, the basis agreed upon by the leading Edison companies for reckoning such equivalents:

	1897. Dec. 31.	1896. Dec. 31.	Increase in one year.	Per ct. Inc.
No. customers	7,313	6,562	751	11½
No. inc. lamps	346,723	279,405	67,318	24
No. arc lights	4,775	3,225	1,550	48
No. motors, h. p.	19,364	15,930	3,433	21½
Total equiv. 16 c. p.	696,370	560,342	136,028	24⅓
Gross station returns †	$2,015,102 09	$1,771,229 83	$243,872 26	13¾
Gen. and oper. expenses*	929,263 87	836,396 77	92,867 10	11
Net station returns †	1,085,838 22	934,833 02	151,005 16	16
Prop. expense* to gross †	46%	47%		

* Exclusive of depreciation charges. † Not including outside earnings.

These figures include only Edison central station direct service.

The following table gives the figures inclusive both of Edison central station service and of isolated plant installations supplied from the Edison stations during minimum hours or for emergencies:

	Central Station Service.	Isolated Plant Service.	Total Service.
Customers	7,313	74	7,387
Meters	9,826	115	9,941
Incandescent lamps	346,723	56,341	403,074
Inc. lamps, 16 c. p. equiv.	354,740	59,578	414,318
Arc lamps, number	4,775	692	5,467
Arc lamps, 8 ampere equiv	5,117	692	5,809
Motors, h. p. equiv*	19,364	962	20,326
Total equivalent	696,370	80,928	777,298

* NOTE.—Miscellaneous equipments, such as heaters, organ control, physicians' apparatus, etc., are included in h. p.

The isolated plant service or emergency connections show lower figures this year, in part because a number of isolated plants have been shut down and are now taking central station service.

These figures do not include those of the high-tension companies operated under the supervision of this Company and constituting practically the high-tension division of this Company. These companies had on their station service December 31, 1897, 35,568 incandescent and 2,426 arc lights, and 16 horse-power in motors, or an equivalent of 60,068 16 c. p., which, added to the Edison station service, gives a total of 756,438, or, with isolated plant service, 837,366 16 c. p. equivalent.

The following table shows the returns from current for each district (I. down-town, II. up-town) for each month, not including the Company's general office expenses, taxes, or depreciation charges, or its outside sources of revenue:

1897	FIRST DISTRICT.			SECOND DISTRICT.		
Month.	Station Gross Returns.	Operating Expenses.	Station Net Returns.	Station Gross Returns.	Operating Expenses.	Station Net Returns.
Jan...	$93,755.58	$21,497.98	$72,257.60	$104,650.91	$33,321.48	$71,329 43
Feb..	85,993.57	19,515.86	66,477.71	91,741.28	30,726 31	61,014 97
March	83,072.98	21,658.57	61,414.41	87,408.88	32,685.61	54,723.27
April.	88,052.80	20,168.97	67,883.83	82,520.62	27,812.76	54,707 86
May..	75,899.21	20,100.16	55,799.05	77,628.92	26,994.51	50,634.41
June..	73,746.59	22,684.56	51,062.03	63,954.49	27,714.31	36,240 18
July..	72,182.31	20,378.12	51,804.19	54,173 89	24,703.84	29,470 05
Aug..	78,397.43	17,675.70	60,721.73	56,310.99	25,165.79	31,145.20
Sept..	79,926.91	19,712.80	60,214.11	63,201.25	31,216.73	31,984.52
Oct...	88,441.20	20,298.76	68,142 44	82,915.16	37,511.59	45,403 57
Nov..	97,611.68	22,139.75	75,471.93	103,733.11	40,304.99	63,428 12
Dec..	106,833.61	24,510.93	82,322.68	122,948.72	46,951.87	75,996 85
	$1,023,913.87	$250,342.16	$773,571 71	$991,188.22	$385,109.79	$606,078.43

Station Equipment.

The equipment at the Duane Street Station was increased during 1897 by the addition of one B. & W. 553 h. p. boiler, one Southwark 2,500 h. p. quadruple expansion engine, and two General Electric 800 k. w. dynamos, making the total equipment at

the Duane Street Station at this date, in boilers, 5,050 (rated) h. p. ; engines, 11,800 h. p., and dynamos, 7,600 k. w.

The Bowling Green Storage Battery Annex, supplementing the Duane Street Station, has a storage battery capacity of 8,000 ampere hours at a ten hour discharge rate, or 4,000 amperes at 125 volts for one hour.

The equipment at the 12th Street Station was increased during 1897 by one B. & W. 333 h. p. boiler, one McIntosh & Seymour 1,250 h. p. triple expansion engine, and two General Electric 400 k. w. dynamos, making the total equipment at the 12th Street Station at this date, in boilers, 1,332 (rated) h. p. ; engines, 2,500 h. p.; dynamos, 1,700 k. w.; and a storage battery, with a capacity of 8,000 ampere hours at a ten hour discharge rate, or 4,000 amperes at 125 volts for one hour.

At the 26th Street Station, two McIntosh & Seymour 250 h. p. engines and four 100 k. w. dynamos were replaced by one Southwark 1,250 h. p. cross-compound engine and two General Electric 450 k. w. dynamos. Its equipment at this date is, in boilers, 2,576 (rated) h. p.; engines, 4,550 h. p., and dynamos, 3,300 k. w.

The 39th Street Station maintained its previous equipment, its capacity being as last year, 1,630 (rated) h. p. in boilers ; engines, 2,400 h. p., and dynamos, 1,840 k. w.

At the 53rd Street Station one N. Y. S. 200 h. p. engine driving one 60 k. w. and one 100 k. w. dynamos were replaced by one McIntosh & Seymour 250 h. p. engine, and two 100 k. w. dynamos, transferred from 26th Street. The equipment consists of, boilers, 1,123 (rated) h. p.; engines, 1,300 h. p.; dynamos, 1,080 k. w.; and a storage battery, having a capacity of 2,600 ampere hours at a ten hour rate.

The 72nd Street Annex Station is supplied by the Manhattan Company from its main station at the foot of 80th Street, with high tension current, operating a 240 k. w. motor at 2,000 volts, which drives two 100 k. w. Edison 135 volt direct-current dynamos.

Operating Results.

The down-town district, including the Duane Street Station and the Bowling Green Annex, reached in 1897 a maximum load of 43,600 amperes, December 16th, the equivalent of

nearly 103,000 16 c. p. lamps lighted at one time. The maximum current supplied by this district in 1896 was 37,250 amperes; in 1895, 31,550 amperes; in 1894, 27,500 amperes; in 1893, 24,400 amperes; in 1892, 21,000 amperes; and in 1891, 13,550 amperes. The best daily average of the year was 17,610 amperes, December 31st. The best average in 1896 was 13,230 amperes; in 1895, 10,769 amperes; in 1894, 9,961 amperes; in 1893, 8,829 amperes; in 1892, 7,906 amperes; and in 1891, 5,200 amperes.

The up-town district, including the 26th Street Station, and the 12th, 39th, 53rd Street and Manhattan Annex Stations, reached during the year a maximum load of 56,355 amperes, December 22nd, the equivalent of nearly 133,000 16 c. p. lamps. The maximum load of this district in 1896 was 42,590 amperes; in 1895, 37,820 amperes; in 1894, 33,200 amperes; in 1893, 27,330 amperes; in 1892, 20,320 amperes; and in 1891, 14,300 amperes. The best daily average of the year was 23,221 amperes, December 22nd. The best daily average in 1896 was 16,433 amperes; in 1895, 14,973 amperes; in 1894, 12,598 amperes; in 1893, 10,673 amperes; in 1892, 7,473 amperes; and in 1891, 7,300 amperes.

At the several stations the maximum load of the year was reached at the Duane Street Station, December 16th, with 42,600 amperes; at the Bowling Green Storage Battery, February 13th, with 3,900 amperes; at the 12th Street Station, December 23rd, with 14,000 amperes; at the 26th Street Station, December 17th, with 24,400 amperes; at the 39th Street Station, November 16th, with 13,000 amperes; and at the 53rd Street Station, December 10th, with 7,660 amperes; and at the Manhattan Annex, November 24th, with 1,900 amperes.

The sum of the maximum loads of the several stations was 107,460 amperes. The highest load of the entire system taken together at any one time occurred on December 20th, a maximum of 95,525 amperes. The best daily average of the system was on December 31st, 39,707 amperes.

Underground Installation.

The mileage of the underground street system December 31, 1896, was, on the 3-wire system, 70.67 miles of feeders and 138.49 miles of mains, a total of 209.16 miles of the 3-wire system; and

on the 2-wire system, 0.17 mile of mains. The total mileage December 31, 1896, including 2.43 miles of cable feeders, was 209.33 miles of mains and feeders. The system also included December 31st, 1896, 1,208 junction boxes at intersections.

During the year 1897, in the down-town district, 3.29 miles of 3-wire feeders have been laid, and 0.53 removed, an increase of 2.76; and 2.93 miles of mains have been laid, and 0.81 mile removed, making an increase of 2.12 miles. Of the old 2-wire system in the down-town district 0.02 mile of mains has been removed. This leaves but 0.15 mile of mains of the old 2-wire system. The net increase in the first district is 4.86 miles.

In the up-town district 5.04 miles of feeders have been laid and 1.32 removed and 4.85 miles of mains laid and 0.97 removed, making an increase of feeders of 3.72 miles and in mains of 3.88 miles, a net increase of 7.60 miles, all 3-wire, in the second district. The removal of feeders and mains up-town was chiefly due to replacement with larger conductors of the small tubing used in some streets when the up-town system was first laid.

The greater part of the feeder system laid during the year consisted of cable feeders, of which there were 2.83 miles laid in the down-town district and 4.22 miles in the up-town district, and none removed; making a total increase of 7.05 miles. As there was a total decrease of 0.57 mile of tube feeders, the net increase in the feeders of both districts amounted to 6.48 miles.

The net increase of the system, in both districts, is 12.46 miles, bringing the grand total December 31, 1897, to 221.79 miles. The increase in junction boxes has been 42, making a total of 1,250.

The number of service connections added during the year was (net) 377 in the down-town district, and 567 in the up-town district; in both 944.

Inspection Department.

The Inspection Department has continued its successful work, combining as hitherto the functions of the general agency with those of general inspection. During the year 235 contractors have reported installations, involving 3,265 reports. Of these, 18 have reported installations reaching over 1,000 incandescent lamps in the year past, being in order of lamps installed: New

York Electric Equipment Co., Davis & Brussel, P. M. Mowrey & Co., Randolph & Sullinger, Zimdars & Hunt, Buschmann & Starratt, Tucker Electric Construction Co., Augustus Noll, Empire Electric Sign Co., C. C. Bohn, Alexander-Chamberlain Electric Co., Vance Electric Co., Western Electric Co., E. Kern & Co., H. B. Breitmeyer, Jr., Brooklyn Electric Equipment Co., J. V. Nelson, and E. W. Hazazer. Of electric motors, which have continued to show marked development, 58 types have been installed on the system, numbering 1,574 motors, averaging 3 horse power each and aggregating 4,737¾ horse power. The special development of the year has, however, been in the increase of enclosed arc lamps, of which 1,633 have been added in 1897 to the system. The figures represent the total additions, without deducting changes and withdrawals.

In 1890 a motor inspection and repair bureau was initiated to promote the development of electric power by making the service more satisfactory through careful attention to power equipments. This bureau has fulfilled its purpose, and meantime outside companies have been developed to do similar work. In accordance with the policy developed by this Company, when in 1892 it gave up its Wiring Department, of confining itself more and more to the business of generating and distributing electric current, arrangements were made toward the close of the year to transfer this bureau to an outside company. Satisfactory arrangements were made, therefore, with the American Electrical and Maintenance Co., of which Mr. A. K. Warren, well-known in the electrical industry, is President, for the the transfer of this bureau, and it was arranged that the four inspectors and repair men in our service should be transferred also, if these employes so desired, to the outside company, with assurances of the same salary and the same prospects of advancement for them. The change has been made, and the good will and existing contracts, with the assent of customers, have been transferred to the American Electrical and Maintenance Co.

Meter Bureau.

The Meter Bureau, under the general charge of the Controller, has continued its excellent efficiency during the year; it

had under its care on December 31, 1897, 9,941 meters, of which 6,744 were Edison chemical meters and 3,197 mechanical meters. The usual careful attention has been given to complaints from customers, as to amount of bills, etc., of which 1,530 were received during the year. In connection with these complaints there were found 215 errors, of which 138 were clerical and 77 technical. The proportion of errors to bills rendered was 1 in 511, or less than 1/5 of 1 per cent., an increase of proportion above that of 1896, due in large measure to the extensive change from chemical to mechanical meters, involving a considerable strain on the Meter Bureau. There is reason to hope that the proportion will be considerably reduced in another year. The Company continues its policy of offering to submit any disputed case to arbiters, and in general has succeeded in showing to customers its desire to treat every one with entire fairness.

Reduction of Rates.

During the year the Board of Directors authorized further reductions of rates on incandescent lighting, as suggested by careful reports made to the Board on costs and prices here and abroad, and their influence on the development and prosperity of electric lighting companies. The Board heartily concurred in the policy of giving the consumer the lion's share of the benefits arising from operating economies and the closer use of capital as business increased, in the belief that this course would extend the field of electric lighting, broaden the Company's field of operations, and thus make its business more steadfastly secure. It was found that in large residences closed often during several months in the year and having large numbers of lamps, utilized only on infrequent occasions, electricity was rightly to be considered a luxury, and the price of one cent per lamp hour proved not to be disproportionate to the actual cost of maintaining the necessary generating and distributing facilities to supply such installations at the time of maximum demand. In some few cases, indeed, it proved that the operating and investment costs were even beyond the one cent per hour rate. On the other hand, it was found that reductions could and should be made to consumers using their entire instal-

lations for an average of several hours daily, whether for lighting or power purposes.

Electricity has the decided advantage over gas that, although it must be produced for the most part at the instant of demand and, therefore, at a higher cost than gas for the maximum hours of demand, as above indicated, it can be made and distributed at much lower cost through several hours in the day, since in a large electricity supply station the additional labor required for increased output is very little, except at the maximum hour. It was found, also, that an electricity supply company should seek to meet competition from two directions, the isolated or private plant in individual buildings, and the gas burner, especially in its improved form, when used for a number of hours each day. To meet the first class of competition, a wholesale rate was adopted, based on the electrical unit of the kilowatt hour, at a standard rate of 10 cents per unit (equivalent to ½ cent per 16 c. p. lamp hour) including lamps, running as low as 5 cents per unit in large quantities for long hours and without lamps. This rate is extended only to wholesale customers, i. e., those whose demand would be sufficient to induce consideration of an isolated plant; it can only be afforded to such consumers, and its wisdom has been shown in the success which the Company has had in preventing the installation of isolated plants, and in some cases during the past year of shutting down isolated plants where already installed. To meet the competition from gas, in long-burning use, the discounts for high average use, from 2 hours per day up, were extended from bills of $200 down to bills of $50.

The results of these reductions have been so gratifying that the actual reduction in the income of the Company which the Directors faced has not been manifest, and the success of the policy thus outlined will justify further reductions from time to time. Such reductions, it should be noted, are not in the interest of any one company as against any other, but are as favorable to small as to large companies, their general effect being to widen the field of electricity supply. Indeed, they should be not less favorable to alternating than to direct current companies, since with alternating systems a house converter energized during the whole 24 hours has been a necessary feat-

ure of the installation, even when the light was used on the average but an hour a day; and reduced rates inducing the use of electricity instead of gas for long-hour consumption are showing an excellent effect on the high-tension companies coupled with the Edison system. It may also be noted that with all the advances in electricity supply the effect upon the gas supply has not been noticeable in reducing the gas demand, but only in lessening the increment the gas industry would otherwise have had from year to year.

Accounting Departments.

The Auditor's Department is entitled to credit for its prompt collection of accounts, for the small proportion of bad debts which it has to report and for the facilities which it has offered in the monthly analysis of costs. In 1896, a card ledger system, adapted from library practice, was introduced for customers' accounts, and its use has been continued with increased satisfaction throughout 1897. The cumbrous books, entailing difficult handling, much waste of space and a yearly re-writing, have been replaced by ledger cards, one for each customer, accompanied by a monthly trial balance book system, which gives the present facts as to the state of a customer's account in case of the loss or misplacement of a card. During 1897, however, no cards have been lost and few misplaced. When an account is closed, its card is transferred from the active account to a separate tray, and if this account is reopened the same card is brought back into the live accounts. In this way a bookkeeper handles a minimum number of accounts in the easiest possible way, and the system has the further advantage that the accounts can be re-arranged in any order desired, as in our own case according to meter trips. This is but one of the many improvements and economies which have been introduced within recent years into our service.

There has also been adapted from library practice a so-called decimal system of classification of expenses, which permits of the closest comparison to the utmost detail. All expense accounts are classified under the heads of "General Office" (0), including only those expenses which the Company has as a corporation; "General Technical" (1), including those

which the Company has as an electricity supply corporation, covering engineering, inspection, metering, etc.; "Production and Production Repair" (2 and 3), covering cost of current within station; "Distribution and Distribution Maintenance" (4 and 5), covering cost of distributing current outside of stations through feeders and mains, the cost of lamps, trimming, etc.; and like general heads. Under each of these a subdivision is carried out on the decimal system as far in each case as is desirable. Thus the total expenses under any head, or the minutest detail of expense, can be instantly traced. It is the practice of the Executive to institute a comparison of these figures monthly with the like figures of the previous month and of the corresponding month in the previous year, in consultation with the Auditor, the General Manager and the District Superintendents, and this careful system of accounting has made possible a thorough control of operating expenses, down to the minutest detail, which has in turn aided in the marked operating economies of recent years.

This system of classification of accounts is also carried through the order division in the Controller's office, where each construction or repair job has a job number classifying it into this system of accounts, as well as designating it individually. The Controller's Department also is entitled to great credit for the careful manner in which purchases and orders have been handled in co-operation with the Operating and Auditing Departments.

City Lighting.

The development of the enclosed arc lamp has not only led to a great extension of the low-tension arc light service, which shows an increase from 3,225 to 4,775 in 1897, but has made possible a remarkable development of low-tension street lighting. After a careful collation of views and plans of arc lamp posts used in various cities here and abroad, the Engineering Department designed a new form of post, for city lighting, of artistic pattern, which has met with general approval, This post bears on its base the arms of the city and the seal of the Edison Company, and is surmounted by a graceful curve in place of the awkward yard arm, and a view of it, as also of the

latest pattern of the twin-lamp post used on Fifth and Madison Avenues, is given with this report. These enclosed arc lamps burn approximately 100 hours without retrimming, permitting a considerable saving in both carbons and labor, so that the same price could be made to the city as for high-tension street lamps, namely, 40 cents per night, which averages less than 4 cents per hour of service. Of these lamps 236 have been installed in the streets during the past year, and 300 more are included in the plans for city lighting for the coming year. The Company has undertaken the lighting of the Seventh and Ninth Regiment Armories, and of other city buildings, with incandescent lamps, and it is expected that other public edifices will hereafter be lighted by electricity instead of gas.

Relations with Employes.

The relations with employes have continued to be thoroughly satisfactory. The Labor Benefit Fund, now put on a definite and permanent basis, has not only provided for the payment of benefits to employes, ranging from 4 per cent. on the annual salary or wages, to those in the employ of the Company for ten years, to 1 per cent. to those of one year's service, but has permitted a wise liberality on the part of the Company in cases of fatal or disabling accidents, where no legal technicality was involved. It is with great sorrow that I report two accidents resulting fatally, and one other serious accident, during the year, aside from minor casualties. None of these accidents were electrical, but all mechanical. In no year had greater pains been taken to insure safety and to impress upon employes the necessity of personal caution in relation to moving machinery, yet in no year have there been so many serious accidents, the Company for several years previous having been remarkably free from fatalities. On September 3rd, William Jessup, a tinsmith's helper in the Installation service, was almost instantly killed by being caught in the fly-wheel of an engine at the 12th Street Station, just as he was rising at the close of the day to leave his work, in a place where work, while the engine was operating, had been forbidden by the foreman in charge. On November 1st, Thomas Daly, in the Operating Department of the Duane Street Station, was caught, in a

moment of inattention, in the coal handling machinery, which he had cared for through several years, and was so seriously hurt that he died at the hospital during the day. On November 18th, Charles Curran, an Installation employe, was caught in the revolving armature by the premature starting of an engine in process of installation at the 12th Street Station and yet in the hands of the contractors—an accident, losing him his left hand, which would have resulted fatally but for his pluck and coolheadedness. In the latter case the accident was not due to any fault or lack of attention on the part of the man who suffered, but in both the fatal accidents, and in most of the casualties of the year, the accidents might and should have been avoided.

The Company, although free from legal liability in these accidents, has caused the wages of its deceased employes to be continued to their relatives for some time, and has made other provisions for their welfare, and in the other case it has set on foot a friendly arrangements with the contractors to provide compensation for the injured employe. In view of these accidents, a circular letter was addressed to all employes urging personal carefulness, and a thorough inspection was made of all moving machinery and other possibilities of danger throughout the stations, with the purpose of providing every additional safeguards possible against like accidents. The Factory Inspectors who have investigated these accidents have borne ample testimony to the precautions taken by the Company to safeguard its employes.

It is also proposed to bring this question of safety more thoroughly before the men through a Labor Council which it is intended to organize during the coming year, to consider this and other matters in which the great body of employes are specially interested. The Staff Council, meeting each Friday for consultation as to the affairs of the Company, including the active officers, heads of departments and superintendents, has been a thorough success, and the Labor Council is planned on somewhat similar lines.

It is the practice of the Company to give careful attention, in a systematic manner, to the salaries and wages of each person in the Company's employ, regularly before the opening of each fiscal year, and also semi-annually and quarterly as occasion re-

quired. All questions of salaries and wages are brought before the Executive in careful reports from the respective heads of departments or superintendents, showing the length of service of the employe, his original remuneration, his last increase of pay and the proposed increase, and these recommendations are made the subject of careful comparison, not only with the compensation given in similar positions in the several departments of the Company, but with the rates of salary or wages prevailing outside the Company. Thus the employes feel assured that their services are fairly considered, and the question of their pay regularly brought to attention, without effort or appeal on their part, and this method of handling rates of pay has helped to bring about the present satisfactory relations between the Company and its employes.

A year ago the wiring contractors making electric installations throughout the city were notified by the electrical workers that on the 1st of January, 1898, an increase in wages from $3 to $4 per day would be required. As the end of the year approached, there was reason to fear a serious strike which would be disastrous alike to the contractors and the workers, and detrimental to the interests of this Company. In view of the wide and cordial relations of this Company with both sides, I felt it desirable to take advantage of those relations to promote an adjustment of the difficulty, and I wish to express my satisfaction with the courteous way in which my communications to the Electrical Contractors' Association and to the Brotherhood of Electrical Workers No. 3, the Union in question, were received, and the agreeable nature of the consultations with individual members. The disagreement, in which there were grievances on the part of the employers as well as a demand for an increase of wages on the part of the employes, was brought to a happy termination in the last week of the year through an arbitration arranged by the United Building Trades' Association on the one hand, and the representatives of organized labor on the other, and I have been gratified at the courteous acknowledgment of the position of the Company in endeavoring to promote such a result. The agreement is for two years, and concessions are made and granted on both sides, and the electrical workers are entitled to great credit and to the thanks of the community



ELECTRIC KITCHEN.

for thus finding a peaceful settlement of their difficulties through arbitration in place of a strike, which must have resulted in serious loss—an example that it is hoped will bear fruit outside the limits of that union, and be in a large way to the interest both of the city and of organized labor.

Electrical Developments.

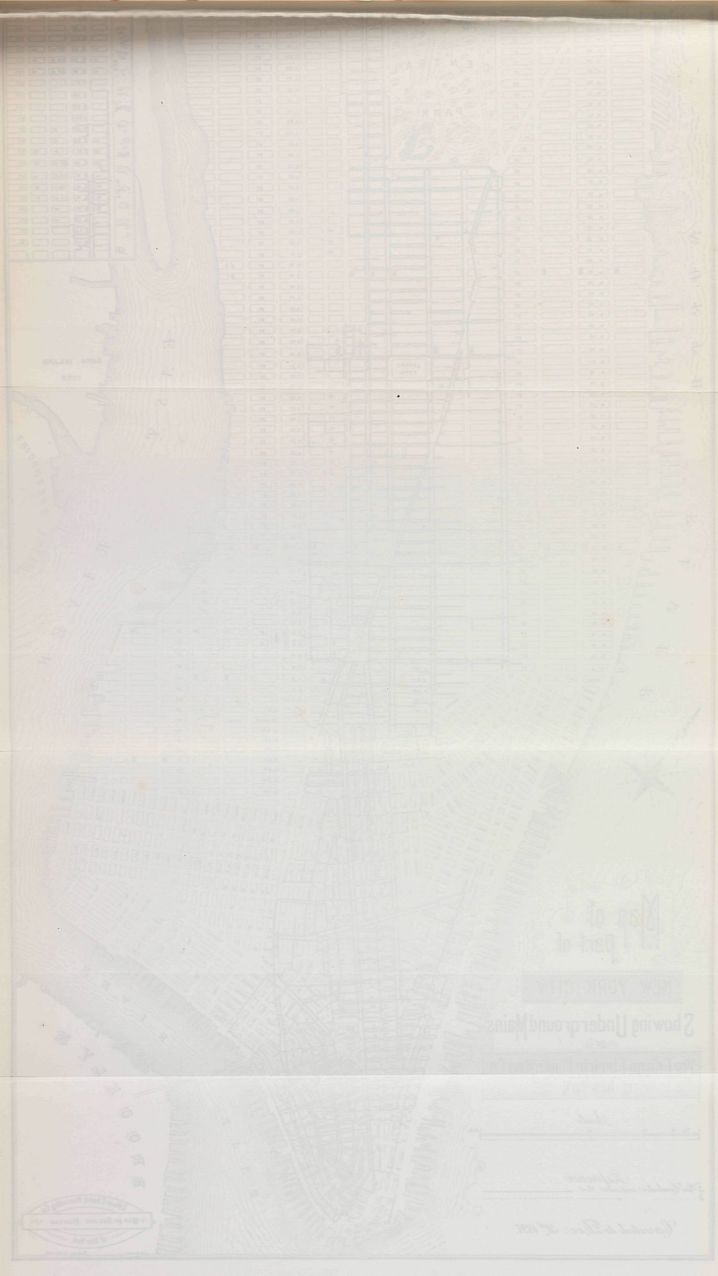
The use of electricity for heating and cooking has shown some, though not great development, and it is hoped that reductions of rates will stimulate this use. The electrical kitchen in the Company's building in Duane St., from which the Friday Staff luncheon is always served, has been a useful object-lesson of the simplicity and convenience of cooking by electricity, and an illustration showing the neatness and compactness of this method, is given with this report. The use of electric carriages, carrying storage batteries which are charged from this Company's system, has become a part of the public cab service in New York, and the Company is planning for supply connections in the street, with automatic meters, which may permit more general use of electric vehicles.

Conclusion.

The Officers and Superintendents of the Company have rendered most efficient service during the year, as is evidenced by the satisfactory results of the Company's business. It is my great satisfaction to acknowledge that these results have been reached by the co-operation of the employes in the humblest posts, each in his measure, as fully as by that of the most important officer. The Company's development has steadily outrun the estimates of growth, and it is evident that the 1,000,000 16 c. p. equivalent installation point will be reached by 1900. In view of this phenomenal growth, the Company's engineers have for the past year again been giving most careful attention to the problems of the future, and are reaching results and working out plans for the new century which will doubtless commend themselves to the judgment of those most concerned, when they are ready for publication.

R. R. BOWKER,
First Vice-President.


CENTRAL
PARK
NORTH RIVER
EAST RIVER
LONG ISLAND CITY
GREENPOINT
BROOKLYN
Map of
Part of
NEW YORK CITY
Showing Underground Mains
OF
The Edison Electric Illuminating Co
of New York
Scale
Reference
3 Wire Conductor indicated thus
Corrected to Dec. 31st 1897
Edison Electric Illuminating Co.
MAP & RECORD BUREAU
of New York



731

ANNUAL REPORT

OF THE

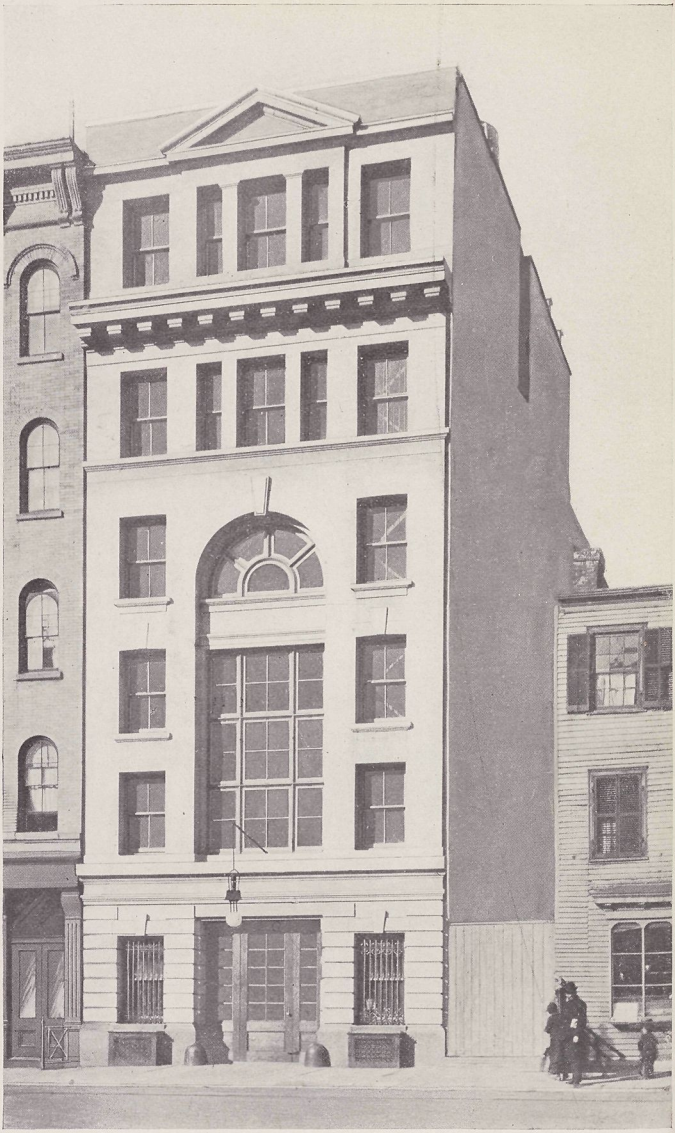
BOARD OF DIRECTORS TO THE STOCKHOLDERS

AT THEIR ANNUAL MEETING

February 14th, 1899.

The Edison Electric Illuminating Co. of New York.

1899.
EDWARD V. BROKAW & BRO., PRINTERS AND STATIONERS,
NEW YORK.



ANNEX STATION AT 200 ELM STREET.

Board of Directors—1898.

A. A. H. BOISSEVAIN,
R. R. BOWKER,
C. H. COSTER,
CHARLES E. CROWELL,
R. FULTON CUTTING,
THOMAS A. EDISON,
W. E. GLYN,
ARTHUR CURTISS JAMES,
D. O. MILLS,
GEO. FOSTER PEABODY,
W. A. READ,
F. S. SMITHERS,
SPENCER TRASK.

Officers.

SPENCER TRASK, - - - - - *President.*
R. R. BOWKER, - - - - *First Vice-President.*
GEO. FOSTER PEABODY, - - *Second Vice-President.*
JOHN W. LIEB, JR., *Third Vice-President and General Manager.*
FRANK ENOS, - - - - - *Secretary.*
JOS. WILLIAMS, - - - *Treasurer and Ass't Sec'y.*
H. M. EDWARDS, - - - - - *Auditor.*

GENERAL OFFICES.

53, 55 AND 57 DUANE STREET.

STATIONS.

53–55–57 DUANE ST.,
BOWLING GREEN ANNEX,
200 ELM STREET,
115–117–119 EAST 12TH ST.,
47–49–51 WEST 26TH ST.,
117–119 WEST 39TH ST.,
118–120–122 WEST 53RD ST.,
123 EAST 83RD ST.

New York, Jan. 19, 1899.

To the Shareholders of

THE EDISON ELECTRIC ILLUMINATING CO. OF NEW YORK.

The business of your Company, during the year that has passed, has continued to show a steady increase, with gratifying financial results, as will appear from the following:

	1898.	1897.
Gross Station earnings,	$2,898,021.89	$2,466,255.71
General and technical expense, including taxes,	424,496.03	349,916.21
Station operating expense,	1,122,422.12*	875,222.64
Depreciation charges,	210,000.00	144,000.00
Total expenses,	1,756,918.15*	1,369,138.85
Net Station earnings,	1,141,103.74	1,097,116.86
Earnings from other sources,	136,025.31*	20,380.18
Total net income,	$1,277,129.05	$1,117,497.04

The interest on bonds in 1898 was $325,000.00, the dividends $542,743.50, a total of $867,743.50.

The station earnings show an increase in gross of 17½% and in net, on the same basis as last year, notwithstanding reductions in rates, of 15%. The ratio of operating expenses, including both station and general expense but not depreciation charges, to gross station earnings, is practically the same as in 1897.

The following are the installations, central station service only, using the rating of arc lamps and motors adopted by the

* The earnings from other sources, 1898, include $117,744 income from subway investments, and the operating expenses include $117,744 additional subway rental, which offset each other in the 1897 figures. The gross station earnings and total net earnings are not effected, but to make exact comparison with 1897, $117,744 should be deducted in 1898 figures rom earnings from other sources and from operating expenses.

leading Edison companies for calculating the 16 c. p. equivalent, *i. e.*, 10 per standard arc lamp and 15 per horse-power :

	1898. Dec. 31.	1897. Dec. 31.	Increase.
No. customers, . . .	9,990	8,711	1,279
No. inc. lamps, . .	443,074	382,291	60,783
No. arc lights, . . .	7,353	7,201	152
No. motors, h. p., . .	24,438	19,380	5,058
Total equiv., 16 c. p., . .	891,614	756,438	135,176

Adding supplementary service, or emergency connections with isolated plants, the installation figures on all services combined, give a grand total of 984,810 16 c. p. lamp equivalent.

Two annex stations, on Elm Street near Spring Street and on 83rd Street east of Park Avenue, have been added to the Company's buildings during the year past, and the installation of improved machinery at the main stations has greatly increased the facilities and bettered the economies of the Company.

The underground system has been extended as far west as Hudson Street, from Canal to 14th Streets, and as far north as 95th Street, on the east side of Central Park.

The reduction of rates has continued, and on October 15th, a new system of rates was put in general operation, experimentally, making much lower prices for the consumption of current after the first hour's average use of a customer's installation. It is gratifying to note that the revenue of the Company has continued to increase subsequently to each rate reduction, so that this policy on the part of your Directors has been thoroughly justified.

The Balance Sheet and Statement of Income Account are appended. Depreciation charges have, as heretofore, been carried in the monthly expenses.

Attention is called to the report of the First Vice-President, presented herewith.

By order of the Board of Directors,

SPENCER TRASK,
President.

THE EDISON ELECTRIC ILLUMINATING COMPANY

OF NEW YORK.

DR. CONDENSED BALANCE SHEET, DECEMBER 31ST, 1898. CR.

License under Edison Patents		$3,159,000 00
Real Estate Construction Property and other Investment Accounts	$12,058,729 43	
12,164 Shares Edison Light & Power Installation Co	1,216,400 00	
		13,275,129 43
Insurance Reserve Investment:		
15,000 Ill. Cent. L. Div. 3½s		
20,000 N. Y. Cent. 3½s, cost		35,450 00
Customers' Accounts and Bills Receivable		286,082 91
Sundry Accounts and Supplies in hand		366,984 75
Cash on hand		171,260 10
		$17,293,907 19

Capital Stock authorized	$10,000,000 00	
Less Stock not yet issued	800,000 00	
		$9,200,000 00
First Mortgage Conv. Gold Bonds	5,000,000 00	
Less Bonds Converted	688,000 00	
		$4,312,000 00
First Consolidated Mortgage Gold Bonds		2,188,000 00
Mortgages Payable		252,122 00
Accounts Payable		128,407 83
Dividend No. 55 (due Feb. 1, 1899)		137,710 50
Accrued Interest Account		71,866 68
Insurance Reserve Fund:		
Bonds, Cost	$35,450 00	
Cash	14,605 13	
		50,055 13
Employes' Benefit Account		29,036 16
Sundry Accounts		210,228 07
General Depreciation Account		296,381 17
Profit and Loss		418,099 65
		$17,293,907 19

JOS. WILLIAMS,
Treasurer.

NEW YORK, December 31st, 1898.

THE EDISON ELECTRIC ILLUMINATING COMPANY
OF NEW YORK.

DR. INCOME ACCOUNT YEAR ENDING DECEMBER 31ST, 1898. CR.

Interest on Bonds		$325,000 00
Dividends:		
May 1st	$131,868 00	
August 1st	135,468 00	
November 1st	137,697 00	
Due February 1st, 1899	137,710 50	
		542,743 50
Customers' and Sundry Accounts Written off		10,316 70
War Expenses Account		5,403 25
Employes' Benefit Account		29,377 00
Balance		418,099 65
		$1,330,940 10

Balance Dec. 31st, 1897		$53,811 05
Net Station Earnings	$1,024,418 43	
Income from High Tension System	117,834 51	
Earnings, other sources	134,876 11	
Total Net Income		1,277,129 05
		$1,330,940 10

JOS. WILLIAMS,
Treasurer.

NEW YORK, December 31st, 1898.

NEW YORK, February 7, 1899.

We have examined the books of The Edison Electric Illuminating Company of New York for the year ending December 31st, 1898, and hereby certify that the above Balance Sheet and Income Account are correct and in accordance with the books. In our opinion they truly represent the operations and position of the Company at December 31st, 1898.

In the course of our audit we verified the Cash and Bank Balances, examined vouchers for payments and counted the securities owned by the Company, which were found correct and in order.

We commend the system of book-keeping in operation and the manner in which it is carried out.

BARROW, WADE, GUTHRIE & CO., *Auditors.*

FIRST VICE-PRESIDENT'S REPORT.

NEW YORK, January 19, 1899.

Spencer Trask, Esq., President,

THE EDISON ELECTRIC ILLUMINATING COMPANY OF NEW YORK.

SIR :

This Company has shown during the year 1898 the most extensive increase of business in its history. Installations in connection with its service, including supplementary supply to isolated plants and connections of the affiliated high tension companies, which together increased over 150,000 16 c. p. equivalent during the year, approximate closely to 1,000,000 16 c. p. equivalent, and the maximum output of the Edison stations proper exceeded, on December 22d, 112,000 amperes. The important work of the year has been in increasing and improving the generating machinery at 26th St. and 12th St. stations, in erecting annex buildings at 200 Elm St. and 123 East 83rd St., in installing three new storage batteries at Elm St., 39th St. and 83rd St. annexes, in providing at 26th St. and increasing at 12th St. stations cooling towers and other condensing apparatus, in installing high tension transmitting apparatus at Duane St. and 39th St. stations and of high-tension cable connecting them, and in extending the underground system to the west as far as Hudson St., from Canal St. to 14th St., and to the northeast as far as 95th St., including Lexington Ave.—all of which, with other provision for the increase of customers' installations, has been done within a capital increase of $1,200,000.

The following table shows, for Edison central station regular service only, excluding high tension service, the net increase in the several classes of installation and in earnings in the past year, reckoning a standard arc lamp as the equivalent of ten 16 c. p. incandescent lamps and a horse-power in motors as the equiva-

lent of fifteen 16 c. p. incandescent lamps, the basis agreed upon by the leading Edison companies for reckoning such equivalents :

	Dec. 31. 1898.	Dec. 31. 1897.	Increase in one year.	Inc. per ct.
Customers	8,587	7,313	1,274	17.4
Incandescent lamps	393,900	346,723	47,177	13.6
Arc lamps	4,968	4,775	193	4.0
Motors, h. p., incl. heat. app.	24,526	19,364	5,162	26.7
Total equivalent, 16 c. p.	822,037	696,370	125,667	18.1
Gross station returns†	$2.423,795.33	$2,015,102.09	$408,693.24	20¼
Gen. and oper. expenses*	1,219,376.90	929,263.87	290,113.03	31¼
Net system returns†	1,204,418.43	1,085,838.22	118,580.21	11
Prop. expense* to gross†	50%	46%		

* Exclusive of depreciation charges. † Not including outside earnings.

The 1898 figures include full subway rentals, which being in part offset by income from subway investments, were given only in part in 1897. Deducting $117,744 on this account from 1898 figures, gives an increase of operating expenses of $172,369, or 18 per cent, and a proportion of expenses to earnings of but 45 per cent.

The following table gives the figures inclusive both of Edison central station regular service and of isolated plant installations supplied from the Edison stations during minimum hours or for emergencies :

	Regular Service.	Special Service.	Total Service.
Customers	8,587	97	8,684
Meters	11,538	184	11.722
Incandescent lamps	393,900	64,120	458,020
Inc. lamps, 16 c. p. equiv.	399,192	67,346	466,538
Arc lamps, number	4,968	692	5,660
Arc lamps, 8 amp. 60 v. equiv.	5,496	692	6,188
Motors, h. p., inc. heating app.	24,526	1,261	25,787
Total equivalent, 16 c. p.	822,037	93,196	915,233

The special isolated plant service gives increased returns over last year, showing an income of $82,275.07, as against $62,585.58 in 1897.

These figures do not include those of the high-tension companies operated under the supervision of this Company and constituting practically its high-tension division.

These companies had on their station service December 31, 1898, 43,883 incandescent and 2,385 arc lights, and 123 horse-power in motors, or an equivalent of 69,577 16 c. p., which, added to the Edison station service, gives a total of 891,614, or, with isolated plant service, 984,810 16 c. p. equivalent.

The following table shows the returns from current for each district (I. down-town, II. up-town) for each month, not including the Company's general office expenses, taxes, or depreciation charges, or its outside sources of revenue:

1898.	FIRST DISTRICT.			SECOND DISTRICT.		
Month.	Station Gross Returns.	Operating Expense.	Station Net Returns.	Station Gross Returns.	Operating Expense.	Station Net Returns.
Jan...	$116,727.06	$31,031.99	$85,695.07	$129,919 09	$47,056 53	$82,862.56
Feb..	100,750.03	27,277.65	73,472.38	109.978 42	42,424.21	67,554.21
March	105,090.18	30.988.71	74,101.47	107.035.88	45,414.19	61,621.69
April.	106,640.93	26,994.52	79,646.41	106,741.97	40,646.99	66,094.98
May..	98,125.89	25,859.29	72,266.60	102.181.30	40,078.17	62,103.13
June..	85,357.68	25,712 85	59,644.83	79.997.83	36,846.80	43,151.03
July..	84,845.89	25,767.17	59,078.72	65.586.14	31,994.01	33,592.13
Aug..	92,038.89	26,642.44	65,396.45	63,635.05	34,886.79	28,748.26
Sept..	100,506.01	26,489.74	74,016.27	78,413.87	39,113.94	39,299.93
Oct...	101,908.84	26,815.73	75,093.11	97,328 61	46,454.55	50.874.06
Nov..	113,205.16	29,130.79	84,074.37	120,594.64	52,145.85	68,448.79
Dec .	116,817.32	34.475.92	82,341.40	140,368 65	61,322.38	79,046.27
	$1,222,013.88	$337,186.80	$884,827.08	$1,201,781.45	$518,384.41	$683,397.04

These expense figures also include full subway rental, without offset.

Station Equipment.

The equipment of the Duane St. station was increased during 1898 by the addition of two Babcock & Wilcox 369 horse power boilers, making the total equipment at this date, in boilers, 5,788 (rated) h. p.; engines, 11,800 h. p., and dynamos, 7,600 kilowatts.

To this direct current generating equipment at Duane St. station was added during 1898 an alternating current equipment for transforming direct current into high tension alternating current for transmission to the 39th St. station, where it

is reconverted into direct current, thereby utilizing the spare station capacity at the Duane St. station for the up-town district where additional capacity is required.

The rotary converter equipment of General Electric manufacture at the Duane St. station has a capacity of 1,200 k. w., represented by two 400 k. w. and two 200 k. w. rotaries, and nine 145 k. w. static transformers.

The Bowling Green annex, supplementing the Duane St. station, has a storage battery equipment representing a capacity of 8,000 ampere hours at 125 volts at a ten hour discharge rate, or 4,000 amperes for one hour.

The Elm St. annex, which was erected during the year, supplements the Duane and 12th St. stations with a storage battery equipment of the same capacity as the Bowling Green annex.

The 12th St. station equipment was reduced during 1898 by one McIntosh & Seymour 500 h. p. compound engine and two 175 k. w. dynamos and increased by two B. & W. 333 h. p. boilers, one McIntosh & Seymour 1,250 h. p. cross-compound condensing engine, and two 450 k. w. dynamos, making the total equipment at 12th St. station, in boilers, 1,998 (rated) h. p.; engines, 3,250 h. p.; dynamos, 2,250 k. w.; and a storage battery with a capacity of 8,000 ampere hours at 125 volts at a ten hour discharge rate, or 4,000 amperes for one hour.

At 26th St. station, three Armington & Sims and one McIntosh & Seymour 250 h. p. engines and eight 100 k. w. dynamos were replaced by two Southwark 1,250 h. p. cross-compound condensing engines and four General Electric 450 k. w. dynamos. Its equipment is, in boilers, 2,576 (rated) h. p.; engines, 6,050 h. p., and dynamos, 4,300 k w.

The 39th St. station direct generating equipment was reduced by three B. & W. 163 h. p. boilers, one DeLaval 300 h. p. steam turbine, one N. Y. S. 200 h. p. and one Straight Line 150 h. p. engines, and two 100 k. w. and four 60 k. w. dynamos, making the 39th St. station equipment, in boilers, 1,141 (rated) h. p.; engines, 1,750 h. p.; and dynamos, 1,400 k. w. At this station, during 1898, was installed the apparatus for receiving the high tension alternating current transmitted from the Duane Street Station. The equipment consists of rotary converters and static transformers of General Electric manufacture of a capacity of

800 k. w., represented by four rotary converters, each of 200 k. w. capacity, and six static transformers, each of 145 k. w. In addition there was installed, in 1898, a storage battery of a capacity of 8,000 ampere hours at 125 volts at a ten hour discharge rate, or 4,000 amperes for one hour.

At the 53d St. station, one Straight Line 150 h. p. engine and one N. Y. S. 200 h. p. engine, each of which operated two 60 k. w. dynamos, were replaced by two A. & S. 200 h. p. engines.

The annex station which had been temporarily installed on leased ground at 72d St. and 5th Avenue, was removed early in the year. It was replaced by an annex station erected during the year at 123 East 83d St., the equipment of which consists of rotary converter apparatus supplied with power from the Manhattan Company's station at the foot of 80th Street, represented by two General Electric rotary converters, of 200 k. w. capacity each and two 220 k. w. static transformers. The station is also equipped with a storage battery having a capacity of 8,000 ampere hours at 125 volts at a ten hour discharge rate, or 4,000 amperes for one hour.

Operating Results.

The down-town district, including the Duane St. station, Bowling Green and Elm St. annex stations, reached in 1898 a maximum load, inclusive of current sent to 39th St. station, of 55,400 amperes, December 22d, and a maximum district load, exclusive of current sent to 39th St. station of 49,000 amperes, December 12th, the equivalent of approximately 116,000 16 c. p. lamps lighted at one time. The maximum current supplied by this district in 1897 was 43,600 amperes; in 1896, 37,250 amperes; in 1895, 31,550 amperes; in 1894, 27,500 amperes; in 1893, 24,400 amperes; in 1892, 21,000 amperes, and in 1891, 13,550 amperes. The best daily average of the year was 19,000 amperes, December 21st. The best average in 1897 was 17,610 amperes; in 1896, 13,230 amperes; in 1895, 10,769 amperes; in 1894, 9,961 amperes; in 1893, 8,829 amperes; in 1892, 7,906 amperes; and in 1891, 5,200 amperes.

The up-town district, including the 26th St. station, and the 12th, 39th, 53d and 83d St. annex stations, reached dur-

ing the year a maximum load of 66,710 amperes, December 23d, the equivalent of over 157,000 16 c. p. lamps, including 4,600 amperes received as high tension current from the Duane St. station. The maximum load of this district in 1897 was 56,355 amperes; in 1896, 42,590 amperes; in 1895, 37,820 amperes; in 1894, 33,200 amperes; in 1893, 27,330 amperes; in 1892, 20,320 amperes; and in 1891, 14,300 amperes. The best daily average of the year was 27,624 amperes, December 21st. The best daily average in 1897 was 23,221 amperes; in 1896, 16,433 amperes; in 1895, 14,973 amperes; in 1894, 12,598 amperes; in 1893, 10,673 amperes; in 1892, 7,473 amperes; and in 1891, 7,300 amperes.

At the several stations the maximum load of the year was reached at the Duane St. station, including current sent to 39th St., December 27th, with 49,600 amperes; at the Bowling Green storage battery, November 21st, with 4,000 amperes; at the Elm St. annex, December 9th, with 3,200 amperes; at the 12th St. station, December 20th, with 18,600 amperes; at the 26th St. station, December 19th, with 30,800 amperes; at the 39th St. station, including rotary converters, December 16th, with 13,700 amperes; at the 53d St. station, October 21st, with 8,900 amperes; and at the 83d St. annex, November 21st, with 2,100 amperes.

The highest load of the entire system taken together at any one time occurred on December 22d, a maximum of 112,950 amperes The best daily average of the system was on December 21st, 47,175 amperes. These figures are for Edison stations only, exclusive of high-tension stations.

Underground Installation.

The mileage of the underground street system December 31, 1897, was, on the 3-wire system, 77.15 miles of feeders and 144.49 miles of mains, a total of 221.64 miles of the 3-wire system; and on the 2-wire system, 0.15 mile of mains. The total mileage December 31, 1897, including 9.49 miles of cable feeders, was 221.79 miles of mains and feeders. The system also included December 31, 1897, 1,250 junction boxes at intersections.

During the year 1898, in the down-town district, 1.64 miles of 3-wire feeders have been laid, and 0.32 removed, an increase of

1.32 miles ; and 6.58 miles of mains have been laid, and 0.85 mile removed, making an increase of 5.73 miles. There still remains connected 0.15 mile of the old 2-wire system in the down-town district. The net increase in the first district is 7.05 miles.

In the up-town district 4.19 miles of feeders have been laid and 2.50 removed, and 7.51 miles of mains laid and 1.58 removed, making an increase in feeders of 1.69 miles and in mains of 5.93 miles, a net increase of 7.62 miles, all 3-wire, in the second district. The removal of feeders and mains up-town was chiefly due to replacement with larger conductors of the small mains used in some streets when the up-town system was first laid.

The greater part of the increase in the feeder system during the year consisted of cable feeders, of which there was an increase of 0.07 mile in the down-town district and 1.98 miles in the up-town district, making a total increase in cable feeders of 2.05 miles.

The net increase of the system, in both districts, is 14.67 miles, bringing the grand total of the low-tension lines on December 31, 1898, to 236.46 miles. The increase in junction boxes has been 120, making a total of 1,370.

In addition to the above, there was laid, between the Duane St. and 39th St. stations, 3.26 miles of a 3-conductor high-tension cable.

The number of service connections added during the year was (net) 413 in the down-town district and 495 in the up-town district ; in both 908.

Inspection Department.

The Inspection Department has continued to combine the functions of the general agency with those of general inspection. During the year contracts have been obtained for incandescent and arc lamps, motors, etc., amounting to 370,727 16 c.p. lamp equivalents, an increase from 300,031 equivalents secured in 1897. Customers giving the necessary guarantees, and thereby securing the best wholesale rates, have increased from 60 to 82, with installations aggregating 44,174 equivalents, and a revenue of $273,035.11, to which should be added $12,948.43 supplied these customers at retail, a total of $285,983.54. Fourteen private plants

were shut down and Edison service substituted, and the "break-down connections" to private plants were increased from 74 to 97, with an installation equivalent of 93,196 and an income of $82,275.07. Of the 370,727 lamp equivalents contracted for, 274 contractors have reported installations, aggregating 163,741 equivalents, covered by 3,633 reports. Seventeen contractors, following, reported installations of over 1,000 incandescent lamps, being in the order of lamps installed : New York Electric Equipment Co., Conduit Wiring Co., Tucker Electrical Construction Co., Randolph & Sullinger, Zimdars & Hunt, J. P. Hall, J. F. Buchanan & Co., W. H. Starratt & Co, Solomon May, A. J. Buschmann, Western Electric Co., Norden Electric Co., Cleveland & Taylor, Halloway & Irish, C. C. Bohn, J. T. Whitehead, G. R. Gray & Co. Power service has continued to show marked development, numbering 1,794 motors of 59 types, and aggregating 5,027 horse power. The special development of the year has, however, been in the increase of enclosed arc lamps, of which 1,733 have been added to the system, replacing however in large measure the open arc lamps. The figures represent the total additions, without deducting changes and withdrawals, the net figures having already been stated.

Meter Bureau.

The Meter Bureau, under general charge of the Controller, had under its care on December 31, 1898, 11,722 meters, of which 4,308 were Edison chemical meters and 7,414 mechanical meters. The usual careful attention has been given to complaints from customers, as to amount of bills, etc., of which 1,530 were received during the year. In connection with these complaints there were found 415 errors, of which 163 were clerical and 252 technical. The proportion of errors to bills rendered was 1 in 340, or less than $\frac{1}{3}$ of 1 per cent, an increase of proportion above the $\frac{1}{5}$ of 1 per cent. of 1897. The Company continues its policy of offering to submit any disputed case to arbiters, and in general has succeeded in showing to customers its desire to treat every one with entire fairness.

Engineering Development.

The engineering work of the year has been concentrated on the completion of the existing Edison system, in its permanent

generating or distributing stations, and the planning of the larger system of the future, centering in the proposed waterside station. Beyond adding two new boilers, deferring the erection of a cooling tower until 1899, the engineering changes at Duane St. station were incidental merely, but there were important extensions and changes at 26th St., 12th St. and 39th St. stations.

The 26th St. station has indeed been largely reconstructed during the year. Twelve of the original small, single-cylinder, high-speed engines of 250 horse-power each, with belted dynamos, which were nearing the end of their life, are now replaced by large units of compound, condensing, slow-speed type with direct-driven generators, and there remain of the former engines only two 250 horse-power engines, in the smaller bays, for reserve and occasional use. Of the new engines, two of 1,250 horse-power each were installed during the year 1898, with the result that without increasing boiler capacity or coal consumption, which last will indeed be much diminished during 1899 by the regular use of the condensing apparatus, the original station capacity of 3,500 horse power has been increased to 6,050 horse power—nearly a doubled utilization of the capital invested in station structure, boilers, etc. The original system of handling coal by means of freight elevators and trucks has been replaced by a modern coal conveyor, and a new ash-handling system has been planned, including a method of delivering ashes from below the sidewalk. A modern passenger and freight elevator has replaced the two coal elevators, and the station offices have been remodeled with fireproof partitioning. Cooling towers have been erected on the roof and condensing apparatus installed within the building, permitting two-thirds of the engine capacity to be run condensing. Much of this construction work was accomplished during the extreme heat of the past summer and while the station was in its usual operation, and although for the time being the reconstruction blocked the sidewalk in front of the station to the annoyance of neighbors and passers by, these double disadvantages were minimized as far as possible by the carefulness of the operating and construction forces.

At the 12th St. station the boiler-room was completely equipped, a new compound, condensing, slow-speed unit of 1,250

horse-power was added, and the cooling tower capacity on the roof doubled, room being left in this station, where a steam turbine and a 450 horse-power, single-cylinder engine are still in use, for the installation of rotary converters in connection with high-tension transmission development.

At the 39th St. station it was determined to use the west side of the station exclusively for storage batteries and rotary converters, and accordingly the three boilers, two small engines and a steam turbine on the west side were moved, leaving the seven boilers and seven small generating units on the west side for reserve and occasional use as an annex equipment. Space was thus provided on the west side of the dynamo floor for a storage battery, whose capacity can be doubled by a like installation on the floor above, and the west side of the operating room was given up to rotary converters and static transformers.

In view of the temporary character of the 53rd St. station and of its generating equipment, made up entirely of boilers, engines and dynamos removed from the other stations from time to time, and of the ultimate use of this station for distribution purposes chiefly, little was done there beyond replacing its switchboard arrangements with the permanent feeder switchboard in its proper place, thus reducing the fire hazard and taking the first permanent step toward making this station a part of the high-tension transmission plan.

Annex Stations.

When Mr. Edison first laid out a system of lighting for New York, he planned for the territory south of 64th St. 38 distribution districts, each with a generating center. His invention of the 3-wire system, and the economical advantages of concentrating the generation of current in large stations, caused a departure from this plan, but, as the demand for electric current has been developing to proportions far beyond original expectations, it has become evident that half-way houses somewhat in line with Mr. Edison's original plan would be necessary as central points of distribution between stations.

The development into practical commercial apparatus within the few years past of rotary converters and other high-tension transmission appliances have made possible the use of annex

stations, not containing steam generating machinery, but equipped with rotary converters and storage batteries. Two buildings of this character have been erected during 1898, one of 25 ft. front at 200 Elm St., near Spring St., midway between the Duane St. and 12th St. stations, and one of 28 feet front at 123 East 83rd St., east of Park Ave., at the northern end of the district, replacing the temporary 72nd St. annex, and supplied, pending the development of an Edison waterside station, from the Manhattan station on East 80th St.

Both these stations were planned—on the same general lines—erected, and furnished with storage batteries during the year, for immediate use in connection with the present Edison underground system, the storage batteries receiving current through the tie-feeders from the Edison generating stations during off hours, which current is distributed in the immediate district during the maximum hours through the same tie-feeders made local feeders by the use of disconnective boxes. In each of these annexes the ground floor is a main operating room intended for the installation of rotary converters and static transformers, corresponding to the usual steam operating room ; above this is a storage battery room, corresponding to the boiler-room in steam stations, and above this are two sets of comfortable and well-equipped apartments for rental to members of the Company's operating force. The facades, as shown in the view accompanying this report, have been designed by the Company's architects, Messrs. Buchman & Deisler, to conform to the general type of Edison stations, as industrial buildings suitable for residence districts.

High Tension Transmission.

The probable demands of the year required that provision should be made for re-inforcing the up-town district from the down-town district, and *vice versa*, pending the development of a waterside station system of supply. The maximum demands in the down-town and in the up-town districts come within the same hour, but at sufficient interval to make desirable an additional supply from down-town, at the extreme maximum up-town, and considerable economy can be effected by transmitting current

from the great Duane St. station to the upper district during other hours.

Accordingly it was planned to connect the Duane St. and 39th St. stations by a high-tension cable, through ducts existing along Broadway, and to install at both ends converting apparatus which could be used in either direction, with the additional advantage that in case of emergency at Duane St. station current could be supplied from up-town. There was accordingly installed in the Duane St. operating room two 400 k. w. and two 200 k. w. rotary converters, manufactured by the General Electric Company, and at 39th St. four 200 k. w. similar apparatus, all with the requisite auxiliary static transformers, etc. By this plan, direct-current is taken from the Edison bus-bar at the usual voltage, converted from direct-current to 3-phase current at 80 volts by the rotary converters, raised to high-tension by the static transformers, transmitted through the cable to static transformers at the receiving end, which in turn lower the current to 80 volts for use by rotary converters, started by direct-current and turning the 80 volt, 3-phase current again into direct-current of the ordinary Edison voltage for delivery to the receiving bus-bar. No change is required in either the rotary converters or the static transformers to enable them to reverse their operation, so that the apparatus at any moment can be reversed at will and current sent northward or southward as demand requires. This cable and the converting apparatus are planned to become a part of the future system of supply, by which both the 39th St. and Duane St. stations could be supplied, to the full extent of their converter capacity, through the cable installed on Broadway when extended east to the proposed waterside station.

Engineering Commission.

A waterside station, to occupy a city block, had been planned in outline in November, 1897, and control of suitable property secured in February, 1898. Before entering upon this important and final phase of development, it seemed desirable to make the most thorough inquiry throughout Europe, as well as in this country, as to the most improved construction and methods anywhere existing, with a view to providing the best

possible construction and thus obtaining the most economical operation possible, before working out the final plans in detail.

Accordingly it was arranged that an Engineering Commission should make a journey throughout Europe with this purpose in view. The Commission included John W. Lieb, Jr., General Manager, John Van Vleck, Constructing Engineer, and Arthur Williams, General Inspector, these gentlemen—representing operating, construction and relations with the public—being selected to give the widest possible range to the inquiry. This Commission sailed from New York on the *Germanic*, June 22d, and reached New York, on the *Kaiser Wilhelm der Grosse*, Sept. 7th. In the 61 days in Europe, they visited the chief electrical stations and electrical and steam manufacturing plants, and consulted with the leading electrical experts and managers, of England, France, Italy, Switzerland, Austria, Germany, Denmark and Sweden, visiting forty different places successively as follows: Liverpool, Prescot, Manchester, Hollinwood, London, Brighton, Rouen, Paris, Genoa, Iso Verde, Rome, Tivoli, Milan, Paderno, Legnano, Venice, Buda-pest, Vienna, Munich, Zurich, Oerlikon, Baden, Rhinefelden, Frankfort, Cologne, Hagen, Essen (Krupp works), Hanover, Berlin, Aschersleben, Stockholm, Trollhättan, Göteburg, Copenhagen, Hamburg, Ipswich, Cambridge, Newcastle, Edinburgh and Glasgow.

An itinerary had been carefully worked out in advance, which was closely followed, and tabulated information was also prepared before starting, to save time and questioning at the several points of inquiry. Blue-prints of the plans for the proposed waterside station, so far as details had been worked out, were taken as a basis for criticism and suggestion, and tabulated American data were also prepared, so that the Commission could give as well as get useful information.

The Commission made a most exhaustive and detailed study of steam and electrical engineering abroad, and brought back information looking toward a much higher efficiency of operation than had before been thought possible. The extraordinary developments in engine economy in Germany, largely in connection with improved superheating methods, led to the suggestion that the engine situation abroad should be carefully studied by the company with which a provisional contract had been made

for engines for the new station, and accordingly, on the return of the Edison Commission, Mr. James C. Brooks, President of the Southwark Foundry & Machine Co., of Philadelphia, promptly sailed on a similar mission on the continent, whence he reports that he has secured the necessary rights, drawings and information to build for the proposed station engines greatly superior to any engines hitherto built in America or England, reaching an economy of ten pounds of steam per indicated horse-power. Special attention was also given to switchboard construction, measuring instruments, testing processes, lighting effects, prices, charging methods, etc., and the report of the Commission on these several subjects will prove of permanent value to the Company.

Waterside Station.

The plans for a waterside station originally outlined in November, 1897, as developed under the engineering direction of John Van Vleck, Constructing Engineer of the Company, during the spring of 1898, and finally completed, after criticism and suggestion both from European and American engineers, during the fall of 1898, are shown in outline in appendices to this report. These plans provide for a station approximately 200 feet front on First Avenue, and extending back between 38th and 39th Streets approximately 400 feet to the East River. They afford place for 90,000 rated horse-power, capable of overload to 135,000 h. p. or even more, in the space stated, with the possibility of extending this to 150,000 rated horse-power, or 225,000 h.-p. overload, should the block be filled in to bulkhead line. The central feature is a main operating room, approximately 100 feet wide and the full length of the block, giving space for two 3000 rated horse-power (half size) units and fourteen 6,000 rated h.-p. units, arranged on either side of the central aisle. These units are of compound, 3-crank, vertical engines, built for superheated steam at 500° F. and at 175 to 200 pounds pressure, the large units having each a single 3-phase generator, the half-size units having a composite generator producing direct current or at will 3-phase current. The condensing apparatus is in close association with the engines, and is supplied by two sets of tunnels communicating directly with the river. The

fields of the dynamos can be supplied with direct current either from the half-size generators, or from storage batteries or from the Edison street system, providing trebly against loss of field excitation. The front end of the station affords place for the switchboard and other electrical controlling apparatus and for rotary converters in connection with the half-size units, the front being broken only by a small entrance way for incidental purposes. The main entrance is at the rear, where an electrical crane traversing the length of the operating room is planned to lift the largest machine parts either from boats alongside or from trucks reaching it by cart-way from 39th Street.

The 38th and 39th Sts. fronts are occupied by boiler houses approximately 40 feet deep, giving space for sixty Babcock & Wilcox boilers arranged in two tiers, an upper and a lower, each provided with superheating apparatus and automatic stokers. Room is given by the arrangement of the windows for withdrawing tubes from the boilers without sacrifice of ground space for that purpose. The ash-delivery floor is below the boilers, and above them are coal bunkers capable, on the two streets, of holding 8,000 tons, and above these are floors for storage-batteries and for repair shops and supply rooms.

In the 10-feet space separating the operating-room from the boiler-houses, the auxiliary apparatus, the steam piping and the smoke flues are placed, and multiple stacks, one for each group of four boilers, rest on this intermediate structure. Thus there are no lines of steam piping, except cross-over piping and connections to each engine, within the operating-room or the boiler-houses ; the engines and boilers are substantially separated from each other in case of a steam accident on either side; the auxiliary machinery is readily accessible and the multiple stacks avoid possibility of a shut-down in case of accident to a single stack.

With superheating boilers, with engines of an economy of 10 pounds of steam to the horse-power, with a minimum distance of steam piping, avoiding condensation losses, and with generators of the highest efficiency, it is believed that current can be produced from such a station at substantially lower cost than in any station yet planned.

The upper portions of the corners on First Avenue, extended

into towers, are planned to afford living apartments for a number of men with their families, in connection with the operating force. It has been proposed to treat the main structure chiefly as an engineering problem, but to make the facade on First Avenue a creditable architectural feature, preserving industrial simplicity of treatment in combination with artistic effect.

The plans, as shown on the diagrams, propose that only the southwest portions of the building should be at first completed, including half the operating room, one out of four boiler-houses, and the southern tower. It has been estimated, however, that to keep pace with the growing demands of the Edison system and the high-tension systems affiliated with it, it will be necessary to build a second boiler-house in 1901, and to complete the entire station before 1906, when its capacity would bid fair to be required by the demand.

From this station, generating current at 6,600 volts, three lines of high-tension cables are proposed; one the line drawn into the Broadway ducts in 1898, another along 3rd Ave. and another along 1st Ave., thus providing independent service in case of serious street accident in any one part of the city. The lines, however, would meet for purposes of test and control at the 12th St. station, unless it should be preferable to avoid focalizing the several lines at one point. The present high-tension stations of the Manhattan and Harlem Companies, at 80th St. and East End Ave., and on 24th St. near 1st Ave., would be superseded by connections through the 1st Ave. cable; the 83rd St., 53rd St., 39th St. and Elm St. annex stations, would become centers for the conversion of current to lighting voltage and for the distribution of current from storage batteries; the Duane St., 26th St. and probably 12th St. stations would remain as steam generating stations for use during one watch daily through the fall and winter season, and probably be closed during the summer. These arrangements would give to the proposed waterside station a remarkable load line, retaining the advantage of steam machinery at the three points named for supply during the time of maximum demand, thus utilizing machinery of good economy and confining the investment and operating cost of the high-tension transmission lines to normal capacity. On this plan, it is believed that the advantages of wholesale generating and high

tension transmission would be combined with the Edison system of supply from district centers at maximum demand and the general advantages of the Edison distributing system, with a resultant economy that would prove exceptional, permitting reductions in price which would make electric lighting at last "the light of the people."

Duane Street Building.

The Duane St. building, combining a central station with the General Offices of the Company, had been built in portions from time to time, confining the investment in station structure to the immediate requirements, and on its completion in 1894 certain features were left unfinished for like reasons of economy. During the past year it has been arranged to finish the details of this building, and important improvements have been made in its interior condition. Provision was made in the original plans for portrait-medallions, on the main facade, of Franklin, Henry, Morse and Edison, as leading American electricians, and on the Pearl St. or operating facade, of Volta, Ampere, Ohm and Watt, representing Italy, France, Germany and England, who had given name to the chief electrical units. This work has now been placed in the hands of Mr. J. Scott Hartley, the well-known sculptor, who will design, and superintend the production of, these medallions.

Great improvements have been made in the operating room, and "the white engine-room," as it has come to be known,—all of the engines being painted white,—has become noteworthy as a model of lightness and neatness, both of these being important factors in operating economy. This feature has the additional advantage of bringing the moving parts of the engines into relief, increasing the safety and convenience of the operating attendants. A second elevator of the Otis type, complementing Sprague elevator, necessary because of the increasing office business of the Company, is in process of installation on the Duane St. front. Most of the columns throughout the building have now been fire-proofed, and inflammable material has been stored elsewhere, to prevent that risk in a fire-proof building which comes from the buck-

ling of iron columns or beams by local fires. The boiler fronts have also been painted white, and a satisfactory floor of "kosmocrete" has been laid in the boiler-room; and the repair shop at the end of this room has also been put in similarly bettered condition.

The General Offices have been re-made with fire-proof partitions, and a wrought iron staircase designed in electrical forms, will presently replace the temporary wooden stairway in the large office hall. This great central hall, of two stories, around which the offices are grouped, offers admirable opportunity for artistic industrial treatment, and in accordance with the original plans, arrangements have been made for a series of designs in sepia monochrome along the frieze above the first row of columns, to be painted by Mr. W. B. Van Ingen, one of the artists selected for the decoration of the Library of Congress. These panels will trace the historical development of electricity, culminating in the invention by Mr. Edison of the incandescent lamp and in his early work in the old Pearl St. Station, which will be commemorated in the panels at the south end.

The portrait-medallions, the electrical forms used for terra cotta courses without the building and for iron work within, the simple decoration of the office hall and the features of the engine and boiler-rooms, will give to this industrial building a distinctive character, representative of its use, without extravagant cost or display, the additional expense of the artistic features being within a total expenditure of $5,000, approximately one-half of one per cent. on the cost of the building.

The upper stories are now entirely occupied by the Company's offices, the rapid expansion of its business having required this capacity at a much earlier date than was originally anticipated.

Reductions of Rates.

The Edison Company has been the pioneer in this city in reducing the rates for electric current, and has made further progress in this direction during the past year. The most important reduction was the adoption, October 15, 1898, of new schedules for lighting, putting incandescent and arc lighting on the same footing, at the same rate per kilowatt hour of demand.

Under this schedule the price of either incandescent or arc lighting is based for retail use on a standard rate of 20 cents per unit, the kilowatt hour, equivalent to 1 cent per 16 c. p. incandescent lamp hours, for the first hour's average use of installation per day, 15 cents (¾ cent) for the second hour's average use, 10 cents (½ cent) for the third and fourth hour's average use, and 5 cents (¼ cent) for each hour's use beyond four hours. For wholesale use, in which case the consumer guarantees, except for two months in the year, at least 2,000 kilowatt hours' consumption per month, and two hours' average use per day, the standard rate became 10 cents an hour, with 5 cents per hour after four hours' average use. Quantity discounts are confined to 5% on net bills above $500 and 10% on net bills above $1,000 in one month. This rate was announced as experimental until January 1, and in applying it to all customers each customer was assured that in case his bills on the former rate-system of quantity discounts would in any one month be lower than by the new schedule, he should have the benefit of the lower rate. Similar rates had previously been put in force, experimentally, on the Manhattan and Harlem systems, affiliated with the Edison system, with gratifying results. The result on Edison bills was a general reduction, satisfactory to most of our customers, although some consumers have shown suspicion at the unusual course of the Company in voluntarily reducing rates. The new schedules did not, however, effect a saving throughout residence lighting, as many residences used their installation on an average of less than one hour a day, so that the second hour's rate did not apply, and in the case of large installations the quantity discount under the old schedule gave better prices. In the circular of October 15, it was indicated that further reductions, possibly to a ¾ cent base rate for retail use, might be made early in the coming year, and the rival high-tension companies—who had, as in previous reductions, been given advance information as to our proposed rates—in adopting a new schedule, included the ¾ cent rate, one company in fact ante-dating our circular as sent to it in proof. This reduction has proved premature in the case of the high-tension companies, which cannot do business as economically as the larger Edison system, but the question of adopting this as a standard rate, as originally outlined in the

Edison circular, is receiving consideration. The general result of rate reductions in 1898, as in previous years, has been, while reducing the income per unit of output, to increase the demand from existing customers, and to obtain new customers in such degree as to give increased net earnings as well as gross earnings. It is believed that the lines of reduction suggested are in the right direction.

Relations with Employes.

The relations of the Company with its employes, and with the labor interests generally, continue satisfactory. The Labor Council, outlined in the report for 1897, has been organized, and has held several useful meetings during the past year. This council was organized by inviting the men of each department to make written nominations in a sealed ballot to the executive, for representatives in a Labor Council, from which nominations the executive, after giving full consideration to all nominees having an adequate number of votes, selected eleven representatives, chosen as far as practicable to represent the several departments and stations. At each meeting the representatives have been invited to bring forward suggestions and criticisms of their own, or from their fellow-employes, as to any points in the system or administration of the Company in which improvements could be made for the safety, comfort or convenience of employes. These suggestions have often been to good purpose, and have been put into practice. Counsel was taken with the labor representatives on several points affecting labor relations, and in particular payments to individual beneficiaries from the Labor Benefit Fund were discussed. Opportunity was also given for each representative to make general suggestions with entire freedom. One of these suggestions, coming from employes in the " white engine room ", showed cordial appreciation of the improvement in the room, and resulted in the appointment of a committee of employes to take into consideration the provision of a neat uniform for the Duane Street operating force, which might later be adopted in other stations. The Labor Council has proved as satisfactory to the officers as it has been beneficial to the men.

The Labor Benefit Fund has been continued, and has provided this year for the co-operative benefit paid during the holidays at the usual rates—which it is intended to increase by 1% in any year when the dividend is similarly increased ; for benefit payments to widows and children of deceased employes ; for wages paid on sick or accident leave ; and for medical services and medicine, thus while benefiting employes relieving operating expenses from charges which are not properly for operating. During the year the Company has lost by death Mr. George Woodworth, a valued member of the Engineering force, who had been in the employ of the Company since 1891, latterly as a chief assistant to Mr. Van Vleck, and four other employes who had done creditable work in their several departments—Mr. Robert Middleton and Mr. Charles Curran, of the installation forces, Mr. J. Mandel of the 26th St. operating force, and Miss M. Cordell, employed in the Meter weighing room. There have been no serious accidents during the year, although a considerable number of minor casualties, resulting often from carelessness, were reported.

The most serious event of the year in relation with employes was the discovery that an Assistant Superintendent of the Installation forces had been systematically borrowing from men under his charge, to an extent quite beyond their resources or his possibilities of repayment. Nothing can be meaner, or more disastrous to proper discipline, than this treatment of men by one entrusted with responsibility over them, and the Superintendent, whose long service with the Company entitled it to better treatment from him, was promptly dismissed. Two employes were found guilty of stealing supplies, and one of them is serving his term in the penitentiary, but the other has not yet been tried. The first plead guilty, and was given in consequence a lighter punishment, but the judge met his plea that his long service with the Company should entitle him to further consideration, with the reply that the confidence which the Company had shown in him should have received better return.

It is gratifying to report that the agreement for arbitration made between the Electrical Contractors' Association and the Brotherhood of Electrical Workers No. 3, has been in force during the entire year 1898, with exceedingly satisfactory results, and has led to a proposal to make arbitration general among the

building trades. Such an agreement could not be in force for so long a time without questions arising under it, and three such points were referred to arbitration, in two cases the executive of the Edison Company being selected as arbiter, as occupying a fairly neutral position between electrical contractors and electrical workers. Minor reasons for dissatisfaction on one side or the other with the workings of this agreement have proved to be of small import compared with the general good accomplished in averting strikes and providing a reasonable method in settling labor disputes.

War Relations.

At the outbreak of the war, the Company was called upon, through Col. Eugene Griffin, to co-operate in arranging for a volunteer electrical corps for work in preparing submarine mine defences in New York Harbor. Mr. Arthur Williams, General Inspector, was specifically charged with the enrolling of volunteers from among the forces of the several electric lighting companies and of the electrical contractors, and this corps, which included nineteen men from the Edison forces, and twenty-one from the Manhattan and Harlem Companies, did excellent service at a critical time in arranging to protect this most important harbor against sudden attack. In view of the inadequate commissary arrangements at Sandy Hook, the Company was forced to provide for feeding its men in this volunteer corps, and consequently placed a large tent on the ground and sent the necessary cooks. During this emergency service, Mr. Robert Middleton, of the Company's installation forces, came to his death under most distressing circumstances, and the sacrifice of his life was one of the first, probably the first, resulting from the recent war, and should be considered as much a patriotic sacrifice to his country as though he had been actually enrolled in the army or navy. While he was engaged in arranging the submarine cables for a mine off Sandy Hook, the outgoing steamer "La Touraine" ran down the boat in which Mr. Middleton and others were at work, and Mr. Middleton was drowned. The officers of the Company have co-operated with Mr. Middleton's relatives in asking that his service should be recognized by the Government as though his death occurred in army or navy service.

A number of the Company's force had been members of the militia forces or of the naval reserve, and fourteen of them left promptly for the front at the outbreak of the war. The Company, in common with other employers, gave assurances that their salaries or wages would be continued and their places kept open for them for a full year. On this roll of honor were: S. J. Fahnestock, Captain 22nd N. Y. Volunteers, W. Carson, R. W. Emerson, J. E. Brown, A. Little, T. McGrath, T. Dineen, A. J. Henderson, R. Dowling, E. Bennett, of the militia, and E. Vail Stebbins, F. L. Kellogg, E. C. deKay and P. T. Buckler, of the naval reserve, on the "Yankee." After the beginning of the war W. D. Brown, Otto Ziegler and P. McNamara joined the military forces. All these have now returned to the service of this Company.

These expenses, for salaries and wages, Sandy Hook work, etc., were kept as a separate charge under war expenses, less compensation paid by the Government for food, etc., and debited on the Treasurer's accounts as a specific charge against Profit and Loss.

Damage Litigation.

It has been the practice of the Company, especially in residence districts, to build its stations so that they should be ornamental rather than detrimental to a neighborhood, to equip them with the most modern and smooth-running machinery, and to avoid all possible causes of annoyance to its neighbors. Where the actual contiguity of the station seemed to be of serious detriment, the Company has been prepared to make reasonable arrangements with its neighbors, either by purchase of adjoining residences or by satisfactory adjustment in the case of larger buildings. In line with this policy, a substantial payment was made and an easement secured on the apartment house property to the west of the 26th Street Station some years since, and this year a payment settling all questions of detriment or annoyance up to its date was made with the owner of the apartment house immediately west of 39th Street Station. This last settlement, however, led to general claims against the Company from residents in the neighborhood of

but not adjoining stations, and a number of suits have been brought, chiefly through the agency of the attorney who served in the 39th Street settlement. Similar suits, in fact, were brought against other electric lighting companies. In two cases, against this company and another electricity supply company, applications for an injunction have been heard, and in both cases the injunction was refused, and in such terms as to make further serious applications for injunctions improbable. While the company has been anxious to make just arrangements with those immediately contiguous to its stations who might have reasonable cause for annoyance, it is not prepared to permit itself to be made the object of speculative attack, and these suits consequently will be stoutly defended.

Progress of the Company.

As this report may be the last from what may be called the Edison administration of this Company, it may be well to present data as to the development of this Company to the present date. Your own incumbency of the Presidency, dating from 1884 extends over both the experimental and development periods in the history of the Company, and as one who came to the service of the Company at the beginning of the latter period, it would seem proper that I should take this occasion to bear specific testimony to the foundation work in the first period, which laid the basis for the after success of this Company. The early history of the Company is recorded in the annual report for 1892, and too much cannot be said for the foresight which in the early years made possible the later development. It has been pointed out by Mr. S. Dana Greene, of the General Electric Company, in the *Electrical Review*, for Nov. 27, 1895, that the present Edison system, making possible the remarkable progress made by all the leading Edison Companies within the last few years, was planned by Mr. Edison almost at the beginning of his work in its leading features of to-day. These include (*a*) direct-connected engines and generators, supplying-through (*b*) underground conductors on (*c*) the three-wire system, by means of (*d*) feeders tapping (*e*) secondary mains, (*f*) low-tension direct-current, in (*g*) "multiple," to (*h*) incandescent lamps of high

resistance filaments in exhausted globes, and (*i*) from the same mains other translating devices (as arc lights, motors, batteries, etc.) in connection with (*j*) a complete line of wiring and safety devices With Mr. Edison's foresight in technical matters, was associated a broad and wise financial and commercial policy looking toward the future, on the part of the Board of Directors, headed for so long a time by yourself, the results of which are apparent in the success of to-day.

I wish to take advantage of the present opportunity to emphasize the obligations of the Company, in its practical administration, to Mr. J. W. Lieb, Jr., for some time its General Manager and now also its Third Vice-President, whose association with Mr. Edison at the beginning in the Pearl St. station, whose wide European experience, whose broad view of principles and policies of administration, and whose working knowledge of every detail of the business, have stood the Company in good stead. During the long period of experiment and development Mr. John Van Vleck has, since Mr. Edison completed his direct work in the initiative of the system, chiefly inspired the engineering development of the Company, and to his remarkable inventive powers, his extraordinary skill in meeting every new engineering situation as it developed, and his breadth of view in working out the plans for all the stations of the Company built since 1890, as the Constructing Engineer, the Company is also greatly indebted.

Station Development.

In this brief summary it is not intended to repeat the history of the experimental period set forth in some detail in the report for 1892, but to summarize the progress, based on that earlier work, which has taken place within the later period. In the spring of 1890, the old Pearl St. station, destroyed, except in its boiler equipment, by the fire Jan. 2, had been re-equipped, with phenomenal energy and promptness, through the co-operation of the Edison General Co.'s representatives from Schenectady, and was furnished with 4 small engines belted to pairs of bi-polar generators, and one direct-connected in the "Jumbo" unit of 140 horse-power, having a total capacity of 855 horse-

power, to which a small annex station in a basement on Liberty St. added 3 smaller units aggregating 450 h. p. The 26th and 39th St. stations, completed in 1888, were equipped also with 11 small units of 200 horse-power engines, belted to dynamos, aggregating 1,400 h. p., in 26th St, and 800 h. p., in 39th St. station, and a site had been purchased for a station in 53rd St. The total equipment of the Company was equivalent to 3,500 horse-power, less than one and a half times the capacity of one of the large units in the present Duane St. station.

Land was purchased for the present Duane St. station in July, 1890, ground was broken in August, and on May 1, 1891, the Liberty St. annex was discontinued, and current supplied from the temporary equipment in the Pearl St. end of the new station. In October, 1891, the Company's administration, which had before been divided among general offices at 432 5th Ave., a wiring department at 431 5th Ave., a superintendency of the down-town district at the old Pearl St. station and fiscal offices at 16 Broad St., was concentrated in general offices temporarily provided in the second story of the Pearl St. portion of the present building. The main building was extended to Duane St. in 1892, and it was completed to its full height in 1894, when the general offices were removed to their final place on the upper floors. Meantime an annex generating station had been equipped under leasehold arrangements in the Produce Exchange building, permitting the old Pearl St. station to be discontinued in 1894. The up-town demand, requiring greater facilities of supply, was temporarily provided for by an annex on 58th St., east of Madison Ave., in connection with the New York Steam Co.'s plant, and later by building in 1892 a provisional station on the 53rd St. site, which has been equipped altogether with boilers, engines and dynamos displaced from the earlier stations as large direct-connected units were permanently installed, and which has, therefore, become known as the " boarding-house " of the Company. Next, the development of the middle district, from Canal to 14th St., was provided for by erecting in 1895 a new generating station of the most modern construction in 12th St., east of 4th Ave. Meantime the Company began to experiment with storage batteries, and placed in its 53rd St. station an English storage battery, the first of con-

siderable size installed in this country. Later the development of American storage batteries permitted the installation of a storage battery in the 12th St. station, and replacement of the Produce Exchange steam annex, in 1896, with a storage battery in the Bowling Green Building. In 1895, the Company imported two De Laval 300 horse-power steam turbines, then attracting much attention abroad, and put them in successful operation, although the limitation of size of this type has prevented the extension of their use. As the street system was extended up-town, a temporary annex, supplied with power from the Manhattan station, was provided on leased ground at the corner of 5th Ave. and 72nd St.; this has been replaced during the past year with a permanent annex station on East 83rd St. A similar annex has been built on new Elm St., near Spring St., to give larger supply and better distribution to the district south of Bleecker St. during maximum hours. Both these stations, as well as the 39th St. station, now used chiefly as an annex, have been supplied with storage batteries during 1898, so that the Company now has eight stations and annexes in operation, aggregating 24,200 horse power, aside from the six storage batteries included in them. The Duane St. station meantime, has been developed to a capacity of 11,800 horse-power, or 7,600 kilowats—in addition to the high-tension transmission system of 1,200 k.w. capacity added to its equipment during the past year. In the Duane St. station nothing smaller than 600 h.-p. units are in operation, 2,500 h.-p. being the standard size, and the best illustration of modern electrical development within the past ten years is the fact that one of these units, occupying half the floor space, and requiring one-fourth the labor, produces twice the product of the entire old Pearl St. station in 1890. The 26th St. station has been re-equipped with three 600 and three 1,250 horse-power units, increasing its capacity from 3,500 horse-power, as originally planned, to 6,050 horse-power, including two reserve small engines, or nearly double. All the new units at Duane, 12th and 26th St. stations have been built to run either condensing or non-condensing, and at the last-named stations cooling towers have already been built, which permit the engines to be run with the maximum economy. Plans have been made for similar equipment

at Duane St., where it was originally intended to utilize the abundant supply of water found in the gravel stratum underneath that station—an intention abandoned because of question whether the foundations of this building might not ultimately be undermined by displacement in this stratum. This brief record of station development illustrates remarkably the progress of electricity supply during this short period of nine years, and also the carefulness with which the Company's capital has been utilized from year to year, with the further advantage that when investment was made, it was made in machinery thoroughly up to date, as would not have been possible had the stations been built and equipped in advance of the demands upon them.

The following table shows the station equipment year by year:

Year, (Dec. 31st.)	Number Stations (including Annexes).	Number Storage Batteries.	Number Small Units.	Number 600 H. P. Units.	Number 1250 H. P. Units.	Number 2500 H. P. Units.	Total H. P. Engine.	Total K. W. (including Batteries.)
1890	5	..	21	..	..	..	3,905	3,442
1891	5	..	22	2	..	..	5,270	4,365
1892	7	..	28	4	..	..	7,615	6,220
1893	6	1	29	5	2	1	13,755	9,760
1894	6	1	25	6	2	1	14,450	10,400
1895	6	1	26	6	2	2	17,500	12,480
1896	7	3	26	6	2	2	18,150	13,630
1897	7	3	26	6	4	3	22,550	16,303
1898	8	6	18	6	7	3	24,200	18,522

Underground Development.

When Mr. Edison, at the initiation of this Company, insisted that it was both practicable and preferable to supply electricity through underground conductors, he had at his disposal only the two-wire system of conductors. Under this system, the limitation of the commercial supply of electric current was at little more than a half mile from the center of supply. His invention of the three-wire system extended the radius of profitable distribution beyond a mile limit, and perhaps the

only engineering mistake of importance made by the Company was the location of the 39th St. station so close to and between the 26th St. station and the proposed 53rd St. station—a mistake offset in later years by using the 39th St. station as practically an annex, now supplying current chiefly from a storage battery and from rotary converters. The original two-wire system, comprising 4½ miles of feeders and 10½ miles of mains, extended from Broad St. east to South St., and from Wall St. north to Spruce St., and this remained as the only underground service down-town until 1890. In 1883, Mr. Edison invented the three-wire system, and previous to 1890 underground conductors on this system had been laid to the extent of 21 miles of feeders and 31 miles of mains, chiefly between Madison and 6th Aves. from 14th St. to 42nd St., and to some extent between Madison and 8th Aves. from 42nd St. to 59th St. In 1890, the three-wire system, which had begun to replace the two-wire system down-town, was extended as far south as the Battery, and as far north as Canal St., and the up-town three-wire system reached as far south on Broadway as Houston St. In 1891, the two systems, reaching north and south on Broadway, were joined; and in that year current was supplied, not without prophecies of evil from many electrical engineers, on a continuous system of 140 miles of electrical conductors, including feeders and mains, extending in a north and south line from the Battery to 59th St., a distance of nearly five miles. Since that time the underground system has been extended east and west from the center of the city and as far north as 95th St., including now 80 miles of feeders and 156 miles of mains, and also a high-tension transmission line of 3¼ miles "drawn in" through high-tension ducts on Broadway between Duane St. and 39th St. stations, to become a part of the final system of transmission. The feeders include a system of tie-feeders installed between the several stations, with disconnective boxes permitting the use of these tie-feeders for local distributing purposes during maximum hours. The following table shows the underground development from 1890 to 1898, inclusive:

Year, (Dec. 31.)	Mileage of Mains.	Mileage of Feeders.	Total Underground Mains and Feeders.	Kilowatts of Installation connected per Mile of Mains.	Yearly Income per Foot of Mains.
1890	71.6	38.7	110.4	60 est.	$1.18
1891	94.2	46.9	141.2	74 "	1.28
1892	114.3	58.2	172.5	94	1.56
1893	122.8	64.6	187.4	123	1.84
1894	126.4	65.4	191.8	150	2.05
1895	134.1	68.8	202.9	193	2.18
1896	138.7	70.6	209.3	236	2.42
1897	144.6	77.2	221.8	269	2.64
1898	156.3	80.2	236.4	293	2.94

The most gratifying result shown in this table is the increase of customers' installations, and consequently of revenue, per foot of main, which has meant constantly increasing returns from the Company's underground investment. An investigation as to the average revenue from the underground service in different parts of the city, shows that the return per foot of main from current averages in general $3.50 a year in the down-town office and factory district, as against $2.50 a year in the residence district. The accompanying map shows the present development of the tie-feeder system, with the location of disconnective boxes, and also the extensions of the service to the north by the lines of the Manhattan and Harlem Companies under the administration of this Company.

Customers' Installations.

Though for a time utilized for incandescent lighting only, the Edison system was planned by Mr. Edison for a variety of uses; as early as 1884 power was supplied to an electric motor, and in 1889 the low-tension arc light had been developed in connection with the underground service. At the beginning of 1890 there were 1,213 customers' installations, with 39,815 incandescent lamps, 110 arc lamps and 470 horse-power in motors, a total equivalent within 50,000 16 c. p. equivalent. The following table shows the successive growth of customers' installations. In 1895 the figures were verified and corrected by a careful survey, since

made annually, which accounts for an apparent falling off in the number of customers in 1895. In the table arc lights are figured as the equivalent of ten 16 c. p. incandescent lamps, and one horse-power in motors, up to 1895, as the equivalent of ten 16 c. p.; after that date a horse-power in motors has been figured as the equivalent of fifteen 16 c. p. incandescent lamps, in accordance with the later and more accurate practice agreed upon by the leading Edison Companies. The figures given include supplementary service connections with isolated plants.

Year, Dec. 31st.	Number of Customers.	Incandescent Lamps, 16 c. p.	Arc Lamps.	Motors. H. P.	Total 16 c. p Equivalent.	Number of K W. Hours Delivered.
1890	1,698	64,174	254	697	77,169	2,139,000*
1891	2,875	94,485	821	2,000	132,695	4,112,000*
1892	4,344	142,492	1,637	3,807	215,967	6,153,000*
1893	5,154	192,691	2,538	5,529	301,006	7,980,000*
1894	5,877	234,494	3,014	7,616	378,874	9,539,000
1895	5,764	291,001	3,741	12,526	518,921	11,097,000
1896	6,634	354,979	4,114	17,072	654,809	13,473,000
1897	7,387	414,318	5,467	20,326	777,298	16,480,000
1898	8,684	466,538	5,660	25,787	915,233	22,777,000

* Estimated.

It is estimated that at the present rate of growth, the total installation at the close of 1899 will reach 1,077,000, and at the close of 1900, 1,266,000 16 c. p. equivalent.

During recent years there has been a remarkable increase in the use to which the electric current as supplied from the Edison system has been put. Incandescent lighting has been applied not only for illumination in the ordinary 8, 16, 20, 24, 32, 50 and 100 c. p. lamps, but to decoration in the miniature lamps of 1, 2 and 4 c. p., to sign lighting, and to medical purposes in the tiny lamps used for throat examination. The low-tension arc lamp, at first practicable only in pairs, or in single lamp with wasteful resistance, was first applied to street lighting in 1893 on the system devised for 5th Ave., and has since been greatly broadened in development through the enclosed arc lamp, which burns for 100 hours without replacing carbons, and which permits the use of single lamps with small waste of energy. The enclosed arc lamp superseded the previous system for street

lighting, as a considerable improvement upon it, and the Company has caused to be designed an artistic post for street lighting, which has set an important example in other cities. The development of electricity supply for power purposes has been most noticeable, over 25,000 horse-power in motors being now supplied from the Edison stations in New York. Of this, approximately two-thirds is for passenger and freight elevators, while the other third is used in printing offices, several daily papers being printed in whole or in part by electric power, and in factories and shops of almost every class. In this division also is included the application of electric current for miscellaneous purposes, as for electric automobiles, the charging of storage batteries, electrolytic work in general, heating and cooking. The application in the last named directions are still in their experimental stage, but their development, as the price of current is reduced, may become not less remarkable than the development of power application in the past few years.

Relations with Customers.

The progress of the Company has been marked by continuous decrease in operating costs and consequent reduction of prices to consumers. The early figures of cost are not clear, but since 1890 the cost for fuel has been reduced to one-half, the cost of labor to a third and the total operating and general expenses to two-fifths of the earlier cost per kilowatt hour generated, and it has been estimated that the full development of the system in connection with a waterside station will reduce the cost of fuel and of labor to less than one-half the present figures. It is found that the charge for fuel and labor, which are the main items of operating cost, form but a small portion of the total cost of delivering electric current; in the early days of the Company, these two items were more than a third, while last year they were but a fifth of the total operating and general expenses. The income per unit sold has steadily decreased with the reduction of prices and the increase of current used, and instead of being 20 cents per kilowatt hour, the base rate since 1890 for incandescent lighting, the total output averaged a return in 1898 of 11 cents per unit sold.

The figures of cost and income indicate the policy followed by the Company of reducing rates to consumers while increasing returns to stockholders as the increase of business and introduction of operating economies permitted. In applying this policy, it has been the practice of the Company to make reductions gradually and persistently rather than sweepingly, with the double result that its customers have been assured that rates would be reduced to all alike as fast as practicable, and its investors that the increase in net earnings month by month and year by year would be continuous. The early price for current was 1 1/5 cents per hour for a 16 c. p. lamp hour, intended to be the practical equivalent of the price of gas at that time. This price was rather low for the conditions of the industry at the beginning, but Mr. Edison's development of the three-wire system, and of a higher efficiency incandescent lamp, effected considerable savings. Previous to Oct. 1, 1890, the price of current was 1 1/5 cents, down-town, and 1 1/10 cent up-town, less 10 per cent for cash, per 16 c. p. incandescent lamp hour, 10 cents per standard arc lamp, and 8 cents per horse-power hour for motors, these standard prices being modified by discounts dependent on the size of the monthly bills. Prices were standardized Oct. 1, 1890, to 1 cent per 16 c. p. lamp hour throughout the system, 10 cents per arc lamp hour and 10 cents per horse-power hour, the discounts for the latter service being so extended as to make the actual price in the case of all but very small consumers, where installation costs were a large factor, as low as or lower than before. In successive years the discounts on monthly bills were increased, and an additional discount for long-hour use was introduced ; a wholesale or kilowatt rate was made a feature of the system for large buildings where otherwise an isolated plant would be installed, and finally in 1898 the system of charging was radically changed by making the long-hour use the chief factor for discounts, and the amount of monthly bill only an incidental factor.

Careful investigation had shown that the amount of the monthly bill was not the proper factor in determining cost and therefore price. In the case of one private residence having over 2,000 lights, ten times as much company investment was required as for an average installation having one-tenth the equip-

ment but using it less spasmodically and for longer hours and paying a like monthly bill. Accordingly prices based on long-hour use were put in trial on the smaller Manhattan and Harlem Companies, associated in administration with the Edison Company, and the results there were so successful in inducing the larger use of electric current, especially in competition with gas, that a similar system was applied throughout this Company's installations from Oct. 15, 1898. The results have been satisfactory and gratifying, justifying the proposal pending before the Board of Directors to make the standard rate for incandescent lighting ¾ cent, a rate which in accord with the indication of the Edison Company's circular of Oct. 1, 1898, has since been made the basis of charge by high-tension companies. The long-hour discount based on the average use of installation had, however, the incidental effect that it caused customers to remove lamps which were unused or little used, so that the total lamp equivalent shown in the table is probably 30,000 less than it would otherwise have been.

The demand during the past few years for a meter which, like a gas meter, makes visible record, has led to the replacement of the Edison chemical meters in large measure with Thomson mechanical watt meters, which the consumer may read for himself. In the meter investigations precedent to this change, it was found that while the chemical meter was the most accurate measuring instrument possible under scientific conditions, and had the merit of never over-recording—unless by clerical error—it had the decided fault of under-recording in certain commercial conditions, particularly in intermittent use. A general change of meters was therefore deferred until a further reduction in rates, so that customers should not have reason to feel annoyed by increased bills as the result of more adequate metering, however susceptible of verification those bills might be. That customers have not been overcharged is shown by the fact that even with mechanical metering there is a considerable percentage of under-record evident in the total returns. The Company has absolutely adhered to its practice of uniformity of rates to all customers under like conditions, and of giving to all its customers alike, without individual solicitation, the benefit of each reduction of rates. Thus the Company has been able without breach

of confidence to show to any customer the contract of any other consumer whom he might suspect to be getting better rates than himself, and the final result has been a steadily increasing confidence in the integrity and fairness of the Company, which has kept its customers in most satisfactory relation with it.

Relations with other Companies.

The general policy thus outlined has been for the most part followed by other electricity supply companies in New York with equal advantage to themselves and the public. Previous to 1890 there had been the usual attempt to regulate competition by contract, but as usual the contract had no sooner been made among the companies than misunderstandings arose which made it practically a dead letter. The Edison Company then adopted the policy of making no arrangements of any kind which might prevent reductions of prices or be in any way against public policy ; but an understanding was had among the executives of the important companies that while each company should be at liberty to make such schedule of rates as it chose, with fair notice to the competing companies, those schedules should be adhered to and no deviations made for individual customers. The practical result of this plan was that the lowest schedule adopted by any one company became the general basis of rates, and thus the public at large was served without discrimination in favor of individual customers. As new smaller companies were organized, there was a natural endeavor on their part to obtain business by making special bargains with individual customers, at tempting rates, however inadequate to cover the real cost of delivering current; and incidentally some customers were lost to the established companies which had a more accurate knowledge of the real cost of electricity supply. But these losses were insignificant in comparison with the gain to the established companies and to the general public by uniformity of charges, permitting general reduction of rates, and this understanding was maintained with few exceptions up to the fall of 1898. Since then there has been evident a tendency to individual bargaining on the part of one of the larger competing companies, but this has not resulted in any serious disadvantage to the Edison Company,

largely because of the confidence on the part of its customers that each and all of them would have at the proper time the benefit of the decreased cost resulting from increase of output and operating economies, which the Edison Company was better able than any other to assure to them.

Edison Association.

For many years past the several Edison Companies have been organized into the Association of Edison Illuminating Companies, for a number of years under the Presidency of Mr. John I. Beggs, former Vice-President of this Company, and later under the Presidency of Mr. C. L. Edgar, First Vice-President of the Boston Edison Co., and of Mr. Samuel Insull, President of the Chicago Edison Co., both long associated with Edison interests. The annual meetings of this Association have been most fruitful in their discussions and practical conclusions, and within the past two years the establishment, under charge of the Executive Committee of the Association and of a special Lamp Committee, of a Lamp Testing Bureau in connection with the purchase of lamps from the General Electric Company, has been remarkably resultful. It has established specifications for the manufacturing and sale of lamps which have given to the incandescent lamp business a certainty which it altogether lacked previous to the adoption of these specifications, and the Lamp Works of the General Electric Company have borne cordial witness to the usefulness of this Bureau to the manufacturers as well as to the purchasing companies. The General Manager of this Company has been the efficient chairman of this Lamp Committee, and this Company for the present year is also entrusted with the executive responsibility of the Association.

Relations with the Legislature.

It has been made a cardinal principle of the Company that the interests of customers and of stockholders alike should be protected against "strike bills" in the legislature and similar attacks from other quarters, by reliance on absolute honesty of method and publicity of figures. In each session for several years back,

there has been introduced into the legislature bills for the reduction of rates, seemingly in the public interest, but really as the usual "strike" against prosperous corporations. It has been my practice to appear personally before the legislative committees, with counsel, bringing all the data that could be required, and to invite from the legislative committees the fullest investigation of the actual facts as to costs and prices. The course of the Edison Company in reducing rates from time to time had made it impossible to obtain for such strike bills the support of public opinion, and the better men in the legislature have proved ready and willing to recognize the force of the facts and figures freely disclosed to them, and to permit the Company to go forward with reductions voluntarily without legislative compulsion. I am able to say from direct knowledge since I took personal charge of this matter that no money or other consideration has been paid by this Company, to any member of the legislature, directly or indirectly, or to any person controlling legislation, in the shape of campaign contributions or otherwise, and I think the other electricity supply companies have held to the same position. The Company, by careful scrutiny of printed bills and through correspondents at Albany, has kept close watch of all measures affecting its interests, yet in some cases strike bills or other objectionable measures have crept through one or both houses. I wish to express the obligations of the Company, and of all interested in right legislation, to those members of the legislature, particularly of recent years in the Senate, who have without other consideration or motive than the desire to treat measures on their merits, caused the defeat of objectionable bills, and in one notable case to Governor Black for his use of the veto power to the same end.

Relations with Labor.

The Company has, of course, been confronted throughout its history with the many difficult questions connected with the employment of labor. In 1890 the operating watch, previously twelve hours, was reduced to eight hours, two watches being replaced by three, so that the eight-hour day became in the

operating department the established practice of the Company. Under the circumstances of the electric lighting business, the third watch could be arranged for the period of least demand, so that the operating costs of the Company for labor, were but fractionally increased, while the conditions of employment were much bettered. In 1891, in connection with the wiring department then a part of the Company's system, there was a strike to compel the Company to employ union men exclusively. Several of the men who struck stated that they had done so only under compulsion and with great regret. The Company then definitely announced the policy to which it has since adhered, that it would not deny to any capable workman the opportunity of employment whether he did or did not belong to a labor organization. Most of the men who had struck returned to work, and although there was a slight effort to renew the strike, that also came to grief. It was made clear to the leaders of organized labor that the Company sympathized thoroughly with every right endeavor to better the condition and increase the wages of working men, but that it could not divide authority by putting its forces under the direction of an organization outside the Company. From year to year everything has been done that could be done to make the conditions of employment in the Company more and more satisfactory to its employes, who have been paid at the highest market wages, to secure and retain the best men. It has been difficult in an industry employing so many kinds of trades, with different hours and different rates of pay, to be absolutely just to all, but by the adoption of an hourly rate based practically upon the union wages for the working day, it has proved possible to employ both union and non-union men without serious embarrassment. When difficulties have arisen they have been met by frank conferences, and an easy method of adjustment has usually been found.

The co-operative principle was introduced by setting aside as an employes' benefit fund a proportion of the excess of revenue beyond operating expenses, proportioned to the amount of dividend paid to stockholders, out of which fund labor dividends were paid at the holiday season to each employe, proportioned on length of service and conditioned on good record

throughout the year. In 1897, a Labor Council was organized, which has held several meetings in 1898, as already described.

The one difficult labor problem in the administration of the Company is the fact that its outside work in connection with the underground system must necessarily be suspended during the winter months. Otherwise than in this department, the employes of the Company have continuous employment at good wages, and they constitute a force of which the Company has reason to be proud.

Company Organization.

With the increase of the business of the Company, it has been necessary to develop a more detailed organization, in which more and more responsibility would be entrusted to heads of departments, in several of which the force is now greater than the total number of office employes of the Company a few years since. Of the corporate officers, the Secretary, Mr. Frank Enos, who has served the Company most efficiently since his promotion from the like position in the Manhattan Company, in 1894, has charge not only of the ordinary secretarial duties, but of all of the relations, except fiscal, of the Company as a corporation, particularly legal and legislative, of the Correspondence Bureau, of the employes' record and of the office arrangements ; while the Treasurer, Mr. Joseph Williams, indirectly employed by the Company so long ago as 1885, and its Treasurer since 1892, has general charge of fiscal relations, which he has handled with fidelity and accuracy for these many years. The Auditor, Mr. H. M. Edwards, promoted from a like position in the Manhattan Company in 1895, has under his immediate charge the bookkeeping division, contracts with customers in relation with their credit standing, the collection of bills, the adjustment of accounts and the analysis of expenses and revenue, in which his qualities of firmness, keenness and courtesy have been utilized in remarkable degree. The Controller, Mr. Charles S. Shepard, who has held that position since 1891, has developed an admirably complete and detailed system of working orders, which insures to the Company strict scrutiny of the elements of cost of each piece of work before it is undertaken, and

he has charge also of the purchase of supplies, the Supply Rooms, the Meter Bureau and the distribution of lamps, in all of which his aggressive alertness and remarkable control of expenditures have stood the Company in good stead. On the technical side, Mr. John W. Lieb, Jr., whose ability as General Manager has already been referred to, is in charge directly of the Operating Department, and indirectly of the other technical departments. Mr. Lieb, who was the first employe of the Company under Mr. Edison in the early days, returned from Milan to the service of the Company in 1894, and has had as his direct lieutenants in charge of the two operating districts Mr. H. A. Campbell, who has been in the service of the Company since 1887, and Mr. W. I. Donshea, who has been in its service since 1890, from both of whom the Company has had the best of service, increasing in value with their increase of experience. Mr. Donshea has nominally charge of the down-town and Mr. Campbell of the up-town district, but a change in location is made from time to time to insure unity in the management of the districts. Mr. John Van Vleck's services, continuous since 1888, have already been referred to ; he has also charge of the Map and Record Bureau, in which all the plans and records of the Company are admirably systematized, and of the Test Room, in which apparatus is tested and standardized. Mr. Arthur Williams, General Inspector, who entered the Company's employ as a boy in 1885, is head of the Inspection Department, employing a large number of inspectors and representatives, many of them recent graduates from the scientific schools, who handle the technical relations of the Company with its customers, and to his unusual ability in organizing his department, in obtaining the best men for its purposes, and in directly representing the Company to the consumer, the Company owes much of its success in the increase of customers' installations. Mr. Henry Stephenson, the General Installation Superintendent, who had charge of the original underground construction in the up-town district as a representative of the Edison General Company, came directly into the service in practically his present position in 1890 and his cheerfulness in meeting obstacles, his knowledge of the Company's street system, his tact in dealing with men, and his experience in every detail of the work done under

his direction, have been ably seconded in interior construction since 1898 by Mr. John Sparrow, Superintendent of Construction, who is in charge of repair and installation work within the stations.

These officers and heads of departments, with Mr. Edw. A. Leslie, as General Manager of the affiliated high-tension companies, constitute the Staff Council, which meets each Friday, at luncheon, for the discussion of the Company's business, and which has proved one of the most valuable features of the Company's administration. At these meetings every feature of the Company's relations, whether in planning a new station, in developing new electrical equipment, in handling relations with customers, in considering reductions of rates, in scrutinizing costs, in settling minor salaries or general wages, or in other fields, receives careful attention from men of different types and habits of mind, so that when a decision is reached it has had the benefit of general discussion and approval. The best illustration of the flexibility of the Company's system is in the fact that its organization permitted the simultaneous absence in Europe last year, on the Engineering Commission, of the General Manager, the Constructing Engineer and the General Inspector, without detriment to the Company's interests, although during the summer it was constructing two new annex buildings, providing for large and varied additional equipment of stations and increasing its business with great rapidity. This was made possible especially by the foresight of Mr. Lieb and Mr. Van Vleck, in developing the engineering plans in great detail, by the ready cooperation of the several members of the Staff in sharing other portions of the work, and by the admirable organization, within the Inspection Department, under which Mr. Pope took the place of Mr. Arthur Williams as head of the Department and in Staff Council.

High-Tension Company.

In 1891, the Company purchased a controlling interest in the Manhattan and Harlem high-tension companies, the lines of which, partly overhead, reached as far north as 125th Street and complemented the Edison system on the East side of Central

Park, supplementing it also on the avenues farther South and paralleling it on a few streets. The purpose of these purchases was to occupy an important field, which has since been partially developed by Edison conductors, and to provide for competition with other high-tension companies in case unfair or rate-cutting competition should develop, without breaking down the Edison Company's policy of uniformity of rates to all customers under like conditions. The remaining securities of these companies were gradually acquired so that the Edison capital now covers also the entire capital of both these companies. In 1895 the Madison Square Company, originally known as the Thomson-Houston Company and later as the East River Company, the lines of which usefully supplemented the existing systems in this Company's control, was also acquired. Pending the development of a waterside station, in which the generating of high-tension current, both for distribution and transmission, should be concentrated, these companies have been kept under separate management, although controlled by the administration of this Company. Mr. Edward A. Leslie, whose knowledge of the high-tension systems in New York is the result of long practical experience, has administered this division of the Company's interests with great efficiency and skill, and the companies have been brought to an earning point which covers fair return on the investments of this Company. As soon as practicable, after this Company had assumed control, the overhead lines were replaced with underground conductors in the subway ducts, important changes were made effecting operating economies without waste of construction investment, and some of the smaller engines displaced from Edison stations have been utilized in the two high-tension stations at 80th Street and East End Avenue and on 24th Street East of First Avenue. This high-tension system, however, has been treated provisionally throughout, pending its final assimilation with the Edison system. Since 1896, the figures of these companies have been amalgamated in the President's annual report, while the specific figures of the Edison Company have been printed in the First Vice-President's report. In this Company's system of book-keeping, the earnings of the high-tension companies are taken over as "earnings from other sources."

Depreciation and Reserves.

In the early days of the Company, a round sum was set apart as a depreciation reserve, being $10,000 yearly for the five years 1886-1890, inclusive; $25,000 in 1891 and $50,000 in 1892. In 1893 no appropriation was made to this account but since 1894 the appropriations have been, successively, for 1894, $125,000; 1895, $100,000; 1896, $127,830; 1897, $144,000; and 1898, $210,000, inclusive of Manhattan and Harlem. An appropriation of $400,000 from 1897 surplus earnings was also credited to this account by special vote of the Board of Directors.

Throughout the history of the Company, it has been the practice to charge actual expenditures for repairs and renewals monthly to specific accounts, and for the last three years depreciation reserve charges have also been included in the monthly accountings. In reckoning depreciation charges for the year, the plan now pursued is to take the original cost of each class of property, as shown on the books, and reckon its depreciation as 2% on station structure, 3% on underground conductors, 5% on boilers and most of the electrical apparatus and 10% on engines and some of the electrical apparatus. From this total is deducted the actual repair and renewal expenditures, and the resulting charge, in round numbers, is deducted month by month from earnings. The amount of depreciation thus figured is credited at the end of the year among the several property accounts, in due proportion. It has been the purpose to continue this charge for depreciation until the book value of the physical property of the Company was brought down to replacement cost, after which the depreciation charges would naturally become somewhat less from year to year. It had been proposed, when further reductions of rates and increase of dividend had made the way clear, to recommend that from surplus earnings should be set apart, as the depreciation charges relatively lessened, offsets to the license and other accounts not represented by physical property, so that ultimately the Company might be in the most conservative financial situation possible and its good-will, which is of large value, now represented partly in the license account, would be the surplus above the actual investment as shown on the Company's books.

In the past year, the depreciation reserve has been equivalent to 2¼% on the capital stock, leaving the net earnings for 1898 on stock, after excluding depreciation charges, over 10%.

In accordance with the general plan of providing reserve accounts, the Company began in 1895 an insurance reserve which has now reached $50,055 and is increasing at the rate of approximately $10,000 per year. The high rate of insurance at that time and the co-insurance requirement made the cost of insuring the fire-proof stations altogether extravagant, and it was therefore decided as the Company had so many stations, it could afford to become its own insurer and set aside the equivalent of premiums for an insurance reserve. The Company's property, outside its main stations, has been kept insured in the regular companies and some insurance has also been carried on the main stations, the difference between these payments and full insurance premiums being credited to the reserve account. The insurance fund has been invested conservatively in outside securities.

Company Prosperity.

It is by the application of the principles above cited, and through the co-operation of the men above named, that the Company has steadily held its own as the largest electricity supply company in the world, to the benefit of investors in its securities as well as of its customers. The following table gives the story of the development of the Company, from the investor's point of view, since its start in 1883 :

	Edison Station Earnings. (Gross.)	Income Other Sources. (Net.)	Total Net Earnings.	Capital, Loan and Share.	Interest and Dividend.	Surplus, incl. Deprec. Charges.	Earnings on Stock, incl. Dep.
1883	$53,089.65		*$4,457.50	$1,000,000		*$4,457.50	
1884	111,872.57		33,222.54	1,000,000		33,222.54	3.2%
1885	127,619 71	$3,713 28	52,610.68	1.000,000	$24,638.00	27,972.68	5.1%
1886	152,695.52	4,884.34	70,051.05	1,000,000	35,328.44	34,722.61	6.7%
1887	180,267.77	11,367.62	89,069.96	2,417,800	41,464.64	47,605.32	3.7%
1888	208,210.78	18,090.98	116,235.26	2,847,800	56,229.98	60,005.28	4.0%
1889	313,254 13	16,519.47	124,031.97	2,847,800	102,637.64	21,394.33	4.3%
1890	446,268.61	42,327.22	229,078.80	6,096,200	126,671.64	102,407 16	5.0%
1891	635,575.49	39,929.94	347,228.63	6,878,400	289 513.61	57,715 02	4.6%
1892	942,575.23	20.446.02	475,137.61	9,200,000	372,742.33	102,395.28	5.7%
1893	1,193.338.91	52,185.96	605,642.72	11,500,000	595,995.33	9,647.39	5.8%
1894	1,369,066.72	95,269.72	789,466.58	12,250,000	683,462.67	106,003.91	7.3%
1895	1,544,822.78	130,408.67	915,758.74	14,368,000	744,759.50	170,999.24	8.2%
1896	1,771,229.33	145,321.89	1,080,156.04	14,380,000	798,320.00	281,836.04	9.6%
1897	2,015,102.09	175,658 82	1,261,497.04	14.437,000	801,174.50	460,322.54	11.8%
1898	2,423,795.33	†282,709.62	1,487,128.05	15,7c0,000	867,743.50	619,384.55	12.6%

* Deficit.

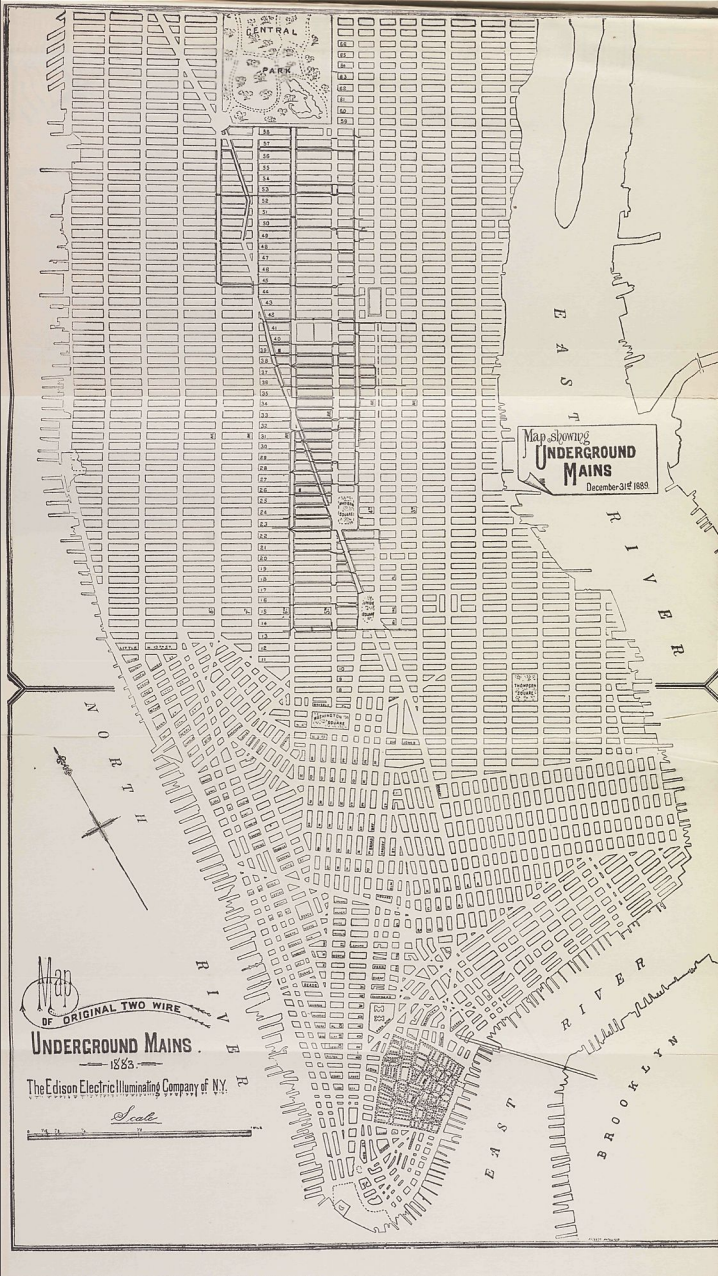
† $117,744 Income from Subway Investment, is included in outside earnings in 1898, but not in 1897.

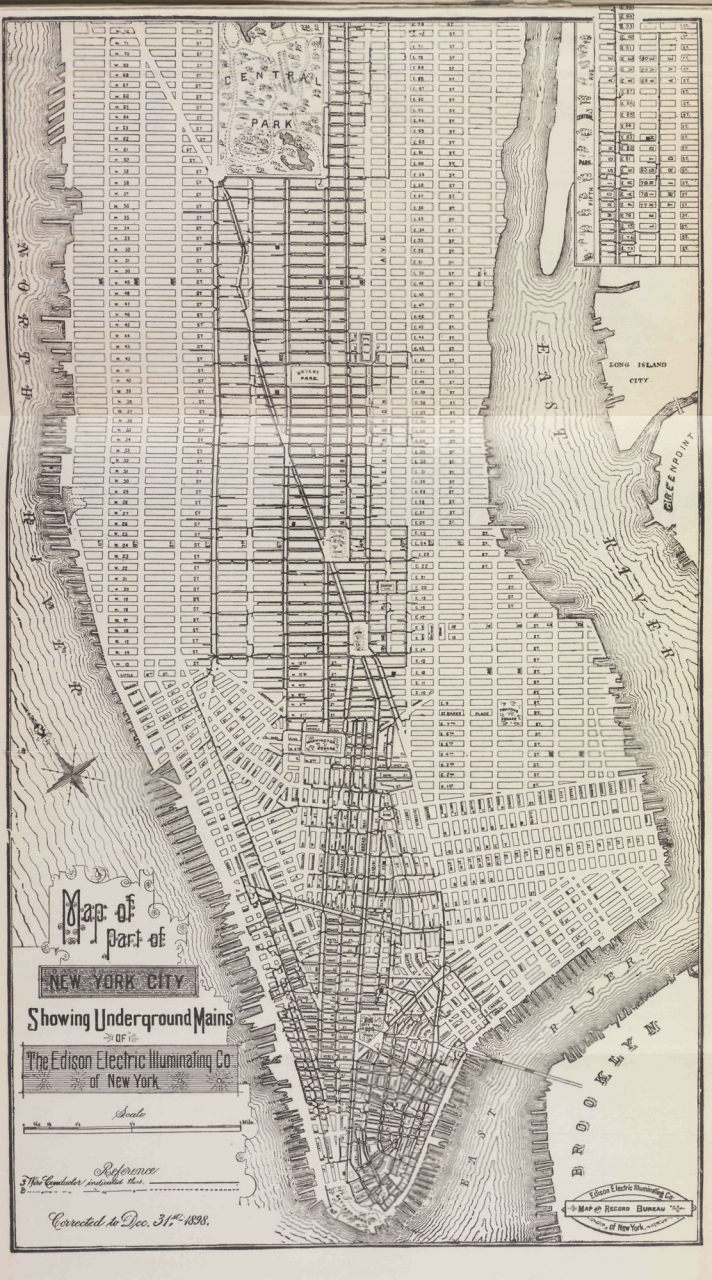
In submitting the above record of the remarkable prosperity and progress of the Edison Company during your incumbency of the Presidency, I wish again, as a later recruit in the Edison service, to express not only the appreciation which every observer must have of the wise administration on the part of the Board of Directors, with yourself as President, of the interests committed to their charge, but also my cordial personal thanks for the support which I have had from yourself and from every member of the Board of Directors in carrying out the lines of policy initiated in or approved by the Board.

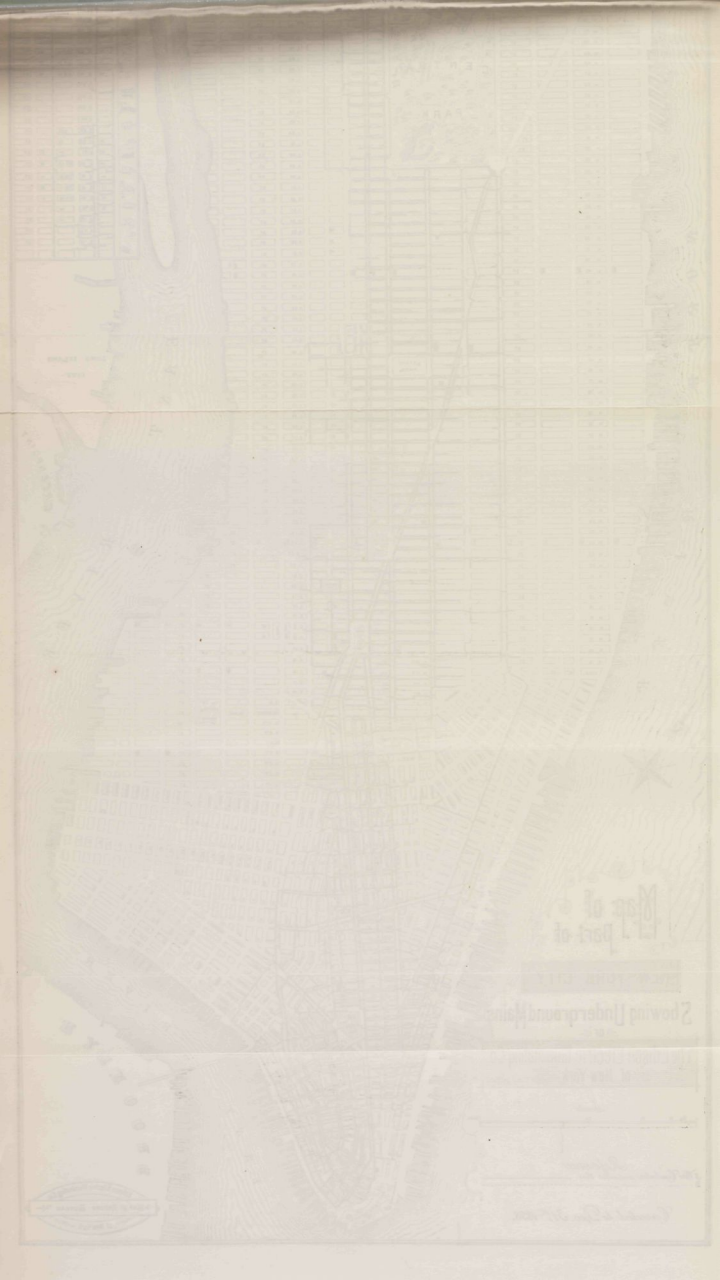
R. R. BOWKER,

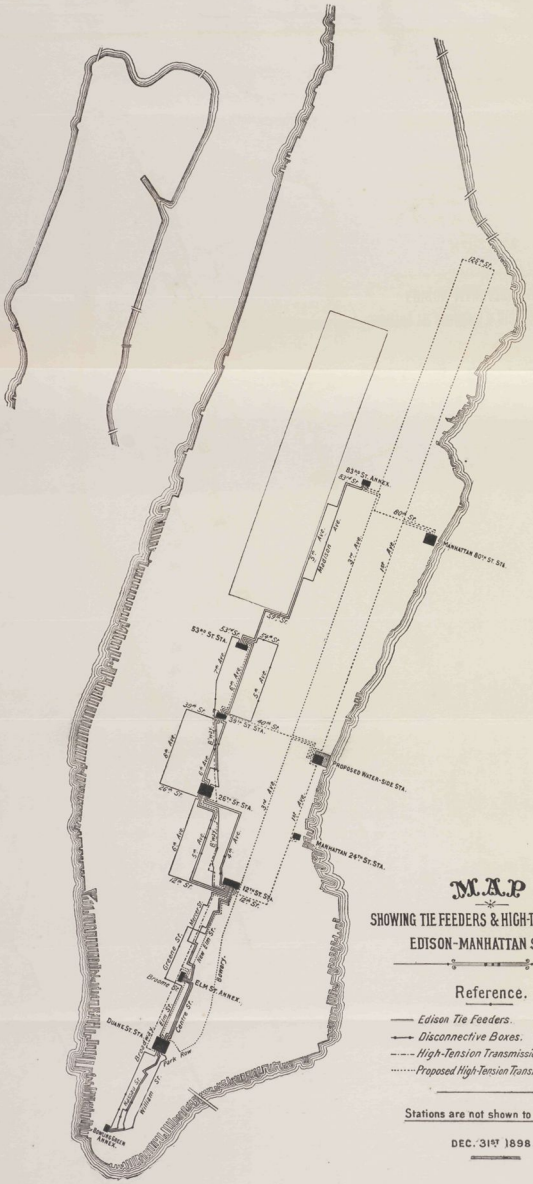
First Vice-President.




CENTRAL
PARK
EAST
RIVER
Map showing
UNDERGROUND
MAINS
December 31st 1889
NORTH
RIVER
EAST
RIVER
BROOKLYN
Map
OF ORIGINAL TWO WIRE
UNDERGROUND MAINS.
1883.
The Edison Electric Illuminating Company of N.Y.
Scale


CENTRAL
PARK
NORTH RIVER
EAST RIVER
LONG ISLAND CITY
GREENPOINT
BROOKLYN
Map of
Part of
NEW YORK CITY
Showing Underground Mains
OF
The Edison Electric Illuminating Co
of New York
Scale
Reference
3 Wire Conductor indicated thus
Corrected to Dec. 31st 1898.
Edison Electric Illuminating Co
MAP & RECORD BUREAU
City of New York





M.A.P

SHOWING TIE FEEDERS & HIGH-TENSION SUPPLY, EDISON-MANHATTAN SYSTEM.

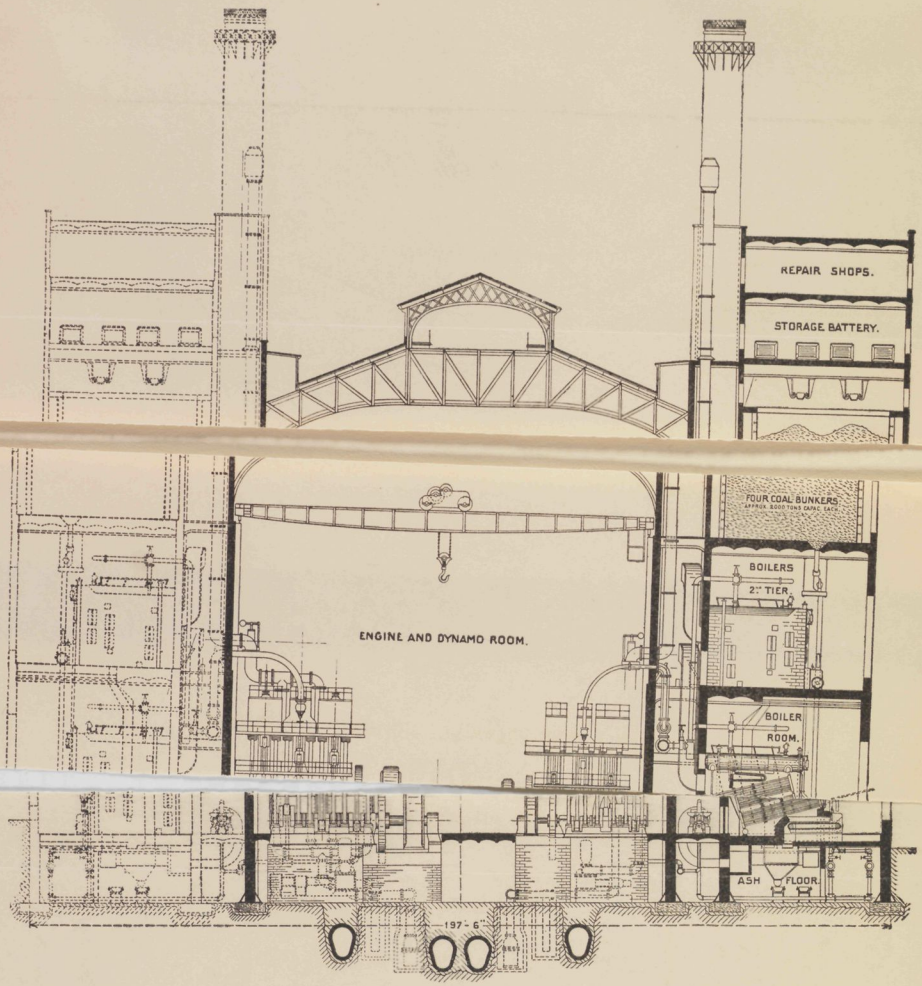
Reference.

- Edison Tie Feeders.
- Disconnective Boxes.
- High-Tension Transmission Line.
- Proposed High-Tension Transmission Lines.

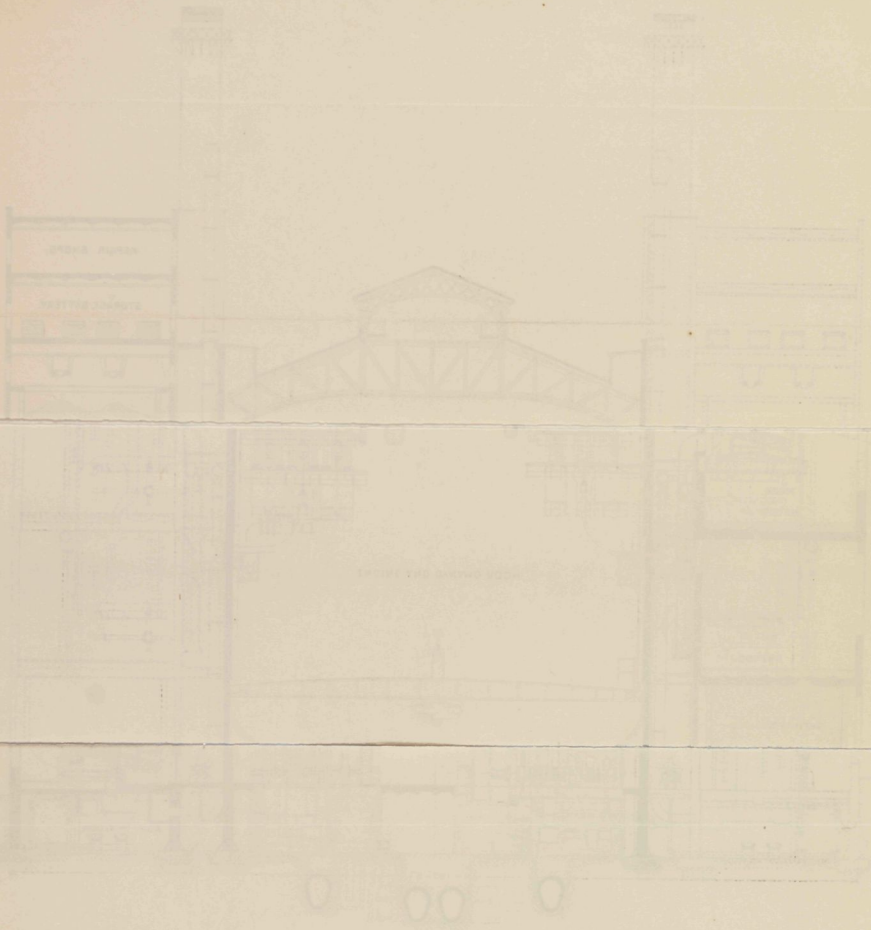
Stations are not shown to Scale.

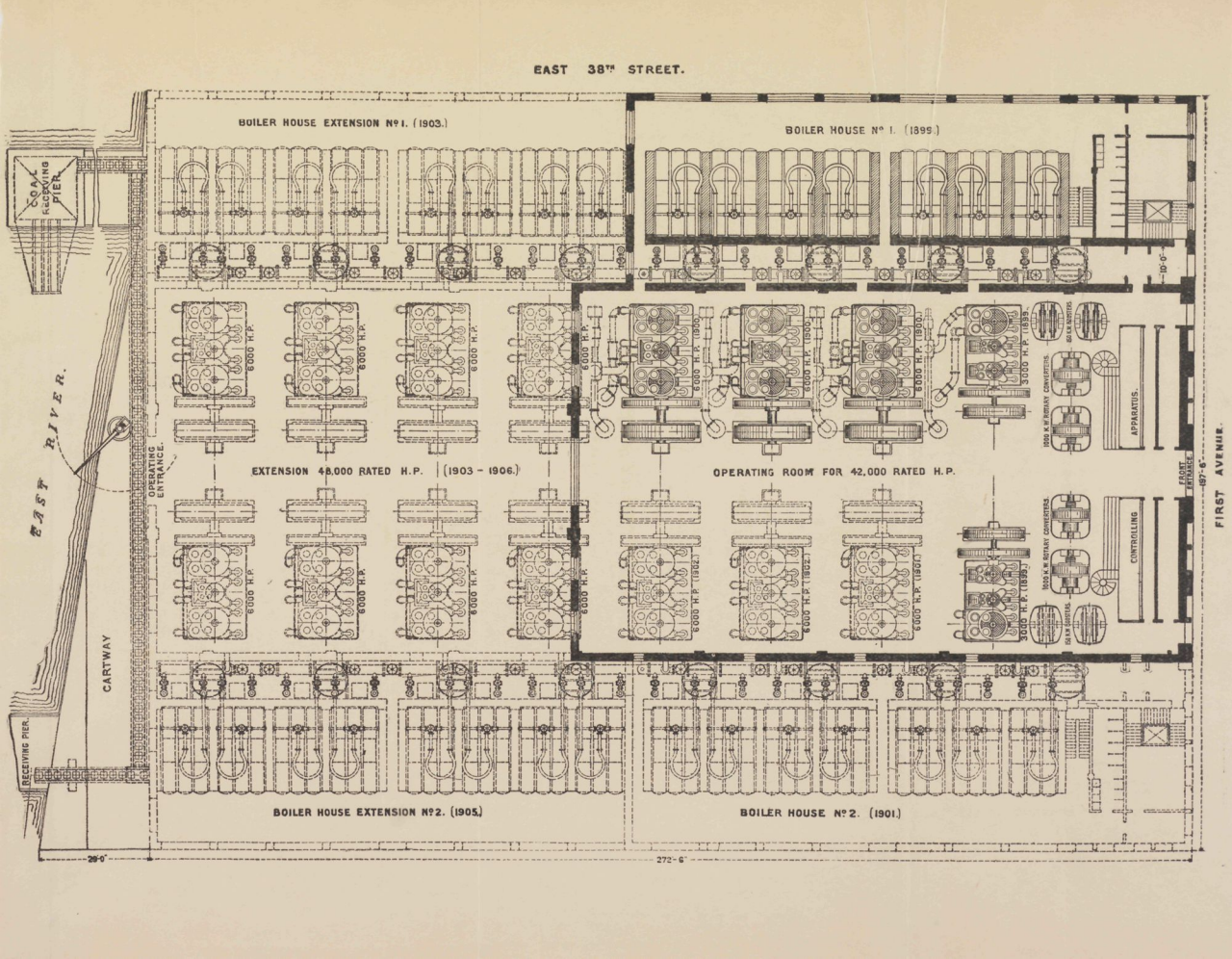
DEC. 31ST 1898.





SECTIONAL ELEVATION FOR WATER-SIDE STATION.




EAST 38TH STREET.
BOILER HOUSE EXTENSION No 1. (1903.)
BOILER HOUSE No 1. (1899.)
COAL RECEIVING PIER.
EAST RIVER.
OPERATING ENTRANCE
EXTENSION 48,000 RATED H.P. (1903 - 1906.)
OPERATING ROOM FOR 42,000 RATED H.P.
APPARATUS.
CONTROLLING
FRONT ENTRANCE
FIRST AVENUE.
CARTWAY
RECEIVING PIER.
BOILER HOUSE EXTENSION No 2. (1905.)
BOILER HOUSE No 2. (1901.)
29'-0"
272'-6"
197'-6"
10'-0"